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ABSTRACT

This report of an Australian overseas study tour to the United Kingdom (UK), the United States (US), and Canada reviews developments and practices as of December 1980 in educational communications and technology, the management and utilization of learning resource centers (LRC's) and independent study programs in postsecondary education, and library automation and network development. A list of the agencies and institutions visited in each country is provided. Based on study tour experiences, it is concluded that despite economic difficulties the influence of computer and communications technologies is more immediately apparent in the UK and North America than is yet the case in Australia. Recommendations are made for Australian action in the areas of screened data or videotex systems, computer-based education, interactive video learning systems on videotape and videodisc, distance education, the use of radio and television for educational broadcasting, education technology units, the establishment of LRC's at selected community colleges, the introduction of automated technologies in libraries, the planning and design of library buildings, joint-use library services, further overseas study tours, and staff exchanges between corresponding agencies and institutions in Australia and the other three countries. (ESR)

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EDUCATION, LIBRARIES, AND THE NEW TECHNOLOGIES

REPORT OF AN OVERSEAS STUDY TOUR OF ENGLAND, THE UNITED STATES OF AMERICA, AND CANADA OCTOBER - DECEMBER 1980

by

ANTHONY J. BROWN

SUPERINTENDENT, EDUCATIONAL RESOURCES
DEPARTMENT OF FURTHER EDUCATION

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I also wish to express sincere thanks to the many people in the countries visited who did so much to make my visits to their institutions so professionally productive and personally enjoyable. Their generous co-operation in setting aside time for discussions, arranging meetings with staff colleagues, and providing information and documentation has made possible the preparation of this report.

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EDUCATION, LIBRARIES, AND THE NEW TECHNOLOGIES:

REPORT OF AN OVERSEAS STUDY TOUR

OCTOBER - DECEMBER 1980

I. INTRODUCTION

The purpose of the study tour was to extend my knowledge and understanding of current overseas developments and practice in:

(1) educational communications;
(2) educational technology;
(3) the management and utilisation of learning resource centres and independent study programmes in post-secondary education; and
(4) library automation and network development.

Initially Cabinet approval was obtained for me to spend 12 days visiting a number of agencies and institutions in England, following a period of long service leave in the U.K. undertaken at my own expense. Subsequently Cabinet gave approval for me to extend the tour at government expense to the United States and Canada in order to study North American developments in these areas, especially in educational communications and in library automation and resource sharing.

The tour was opportunely timed in that it followed very closely on the preparation by the Educational Resources Branch of a position paper on 'Applications of Educational Technology in TAFE' in connection with the Keeves Committee of Enquiry into Education in South Australia. Consequently it gave me the opportunity to observe at first hand the present state of development and actual applications of many of the new technologies discussed in that paper, including computer-based education, instructional television using the mass media, the videodisc, teletext and viewdata, and satellite communications.

It also allowed me to examine a number of automated and mechanised library systems, both shared and self-standing, so as to assist in forward planning for the introduction of such systems within D.F.E., and in determining the

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extent to which the Department should participate in shared systems with other agencies. An important related activity was to discuss with colleagues in the countries visited the management and organisation of learning resource centres in their institutions, and the forms of staffing structure considered most appropriate to ensure their effective participation in educational programmes. It was instructive that in the Universities and Colleges visited in North America (selected generally on the basis of their academic reputation) the senior library or LRC staff invariably had faculty status and took part in the academic governance of their respective institutions in the same way as other faculty members.

The official part of my trip was preceded by four weeks long service leave in the United Kingdom, spent largely in the English countryside in Suffolk and near Oxford, and in visiting a number of cathedrals, parish churches, museums, and other places of historic interest. In addition to the evidence thus provided that buildings decay, technologies wane and disappear, and the fact of change is the one constant in human affairs, I found the break from normal routine physically and mentally refreshing, and of great value in sustaining me through the following eight weeks of varied and at times hectic activity, during which I visited close to 50 organisations and institutions in three countries.

II UNITED KINGDOM

I was in England from Tuesday 30 September to Wednesday 12 November, when I left by air for Washington, D.C. I was on official duty from Monday 27 October. During this time I visited the following agencies and institutions:-

Cambridgeshire College of Arts and Technology, Cambridge
Ely Resource and Technology Centre
Office of Arts and Libraries, London
The British Council, London
Council for Educational Technology, London
ORACLE (London Weekend Television), London
PRESTEL, London
British Broadcasting Corporation, London
Independent Broadcasting Authority, London
Blackwell's, Oxford
Open University, Milton Keynes, Bucks
Loughborough University of Technology, Leics.
Centre for Research on User Studies, University of Sheffield
Sheffield City Polytechnic

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Radio Sheffield (BBC)
Piccadilly Radio, Manchester
Manchester Polytechnic
Abraham Moss Centre, Manchester

A. General Impressions

We have heard much in this country of the current economic problems facing the United Kingdom, and the seriousness of the situation was brought home by the nightly news-casts reporting factories being closed and the number of jobs lost. The impact of technological and social change on a particular industry was demonstrated by events in newspaper publishing during October - one of London's two evening papers ('The Evening News') ceased publication, the proprietor of another London daily placed his staff on notice that the continued existence of the paper would depend on their agreeing to forego any wage rises during the next twelve months, and 'The Times' and 'Sunday Times' were declared to be uneconomic and placed on the market.

As in Australia, government expenditure on public services is being rigorously reviewed, with education and the health services seemingly singled out for particular attention. I was informed that the official budget allocation to the Council for Educational Technology is being reduced by one-third over a three year time span, while Manchester Polytechnic has been required to reduce its annual expenditure by £2 million. Despite the cutbacks, however, there is considerable innovative research under way on potential applications of the new technologies in education, while in libraries the thrust towards increased use of automated systems continues to gather strength; and to a much greater extent than in Australia the broadcast mass media (radio and TV) are being used to present a range of educational programming - from adult basic education through non-formal community education to degree-level courses.

B. Educational Communications and Technology

(1) Screened Data Systems and Education

The United Kingdom is generally considered to have a head start on the rest of the world in the introduction of data transmission systems that utilise television channels, FM radio broadcasting,

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telephone line circuits or a combination of the three, to bring information to viewers equipped with a properly modified TV receiver. I particularly wished, therefore, to study current British developments in teletext (a one way system which 'piggybacks' data on the normal TV broadcast signal by inserting its messages in unused lines of the vertical interval) and in videotex (a two way interactive system in which the user requests information, via the telephone network, from a computer data bank for display on the home or office TV set), and to inform myself of prospective educational applications. To this end I visited the offices of ORACLE (Independent Television's teletext service), Prestel (the videotex system developed by the British Post Office), and the London headquarters of the Council for Educational Technology. I also saw teletext and videotex services in operation in several of the libraries visited, and attended a national Viewdata Exhibition at Earl's Court, London.

There are several significant differences between the teletext and videotex services - including developmental cost, costs to the user, capacity of the system, editorial responsibility, hours of use, waiting time, and size of the audience. Although at the time of my visit it was estimated that there were 150 000 - 160 000 sets modified to receive teletext, as against 6 500 for Prestel, and 97% of homes had TV sets as against 60% with a private telephone, in the longer term Prestel appears to have a much greater potential for educational use because of its vastly greater storage capacity and interactive capability. Where broadcast teletext is limited at the most to several hundred 'pages' (a page consists of a maximum of 960 character spaces - 40 characters across by 24 rows deep), Prestel already provides more than 160 000 pages of information, and in principle there is no upper limit to the ultimate size of the data base.

There is little doubt that the arrival of teletext and videotex has increased TV's potential for education. Not only do these services involve a return to reading, but the medium is particularly well suited for the kind of word games that teach children, or adults learning English as a second language, to master advanced vocabulary. ORACLE and CEEFAX (the BBC's teletext service) have jointly experimented with word games, quizzes and puzzles based on word play with notable success. Two separate educational experiments have been carried out - the first with 19 schools and technical colleges, the second directed

at primary school students. In addition to these specific educational projects, it is evident that many primary and secondary schools are using teletext to keep up with current events. The response to questionnaires has shown that this aspect of teletext interests teachers almost as much as its potential for more traditional educational items.

Considerable interest is being shown in the development of educational 'telesoftware' (ie software at a distance) as a means of meeting the demonstrable educational need for interaction between the user and curricular and test materials. Initially telesoftware was conceived as an adjunct to teletext services, by which means computer programmes could be broadcast via the teletext services to an enhanced teletext decoder inside a TV set. Since the decoders already contain micro-processor memories, only small additions are required to enable them to retain a computer programme which could then be run inside the 'intelligent' TV set, which in effect becomes a micro-computer, using the keypad as a terminal and the screen as a VDU.

The ORACLE development team at London Weekend Television is associated with CET, the Schools Council and researchers at Brighton Polytechnic in an evaluation of teletext - based telesoftware with CAL content related to schools broadcasts. Ten prototype receivers will be placed in selected schools; the researchers will identify suitable subject areas, prepare programmes for transmission, monitor their use, and report on the experiment after one year.

The telesoftware concept has also been adapted for videotex systems enabling local micro-computer/videotex terminals to be in communication with a central main-frame computer via the telephone line. Since the telephone line need only be open for the length of time needed to transmit the computer programme, there are significant cost savings for educational users.

The potential educational applications of the Prestel system are being examined by the Council for Educational Technology (CET) with the help of the Department of Industry. The Department has made available 32 terminals to educational users for one year, including primary, secondary and special schools, further education and higher education colleges, and an industrial training board, with the aim of discovering

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the potential of the system for particular subject areas with different age ranges and using various teaching/learning methods.

The investigation also seeks to discover the real costs of using Prestel as an educational delivery system; although DOI has provided the terminals, the experimental users will have to meet the running costs, including phone calls, computer time, and the cost of retrieving particular pages. Results of the trials are not expected until late 1981.

CET is also a Prestel Information Provider, in which capacity it pays an annual fee of £4 000 for 1 000 pages, and a page cost of £4 for information entered. It acts as an 'umbrella' agency for educational institutions, and recovers costs by charging other bodies using its services a page fee of £16 for editing and entering data. Another educational user is the Universities Council for Central Admissions (UCCA), which provides details of the range of higher education courses available. UCCA is also trialling with a small number of schools the possibility of handling university enrolments via the Prestel network. If successful, it is thought possible that not only could all course information for students be provided via Prestel, obviating the need for conventional printed handbooks, but that eventually (perhaps as early as the mid-80's) the handling of admissions could be fully computerised without the need for drawn-out written communications between students, UCCA, and the individual universities.

Despite these promising beginnings, many people with whom I spoke believe that the best applications will begin to emerge when the Prestel facility becomes more generally available (it is still confined to little more than half the country). As just one example, the Ely Resources and Technology Centre is developing an imaginative proposal to link district schools in a social/historical survey of local communities. The real significance of these developments for South Australia, which relatively speaking is still in the stone age of information technology, is that by the time teletext and videotex become available here later in this decade, there will be a considerable corpus of educational experience in the U.K. on which to draw for inspiration and emulation. In the meantime, it is most important that ongoing research and development in this field should be closely monitored.

(2) Computer-Based Education

While at CET I also took the opportunity to discuss briefly with the Assistant Director, Mr. Leslie Gilbert, and other members of staff the Council's involvement with computer-assisted learning (CAL) and training (CAT). As an agency concerned in the broadest sense with the design and application of learning systems in education, CET has a long standing interest in monitoring and assessing developments in this area. It publishes a free newsletter "CAL News" which carries reports on current projects; maintains a register of people and programmes currently active in the U.K.; and organises or supports conferences on topics associated with the use of computers in education.

I was struck by the variety and scope of the activities currently under way, in all education sectors from infant schools to universities, and in different parts of the country. This doubtless reflects the influence of the government-funded National Development Programme in Computer-Assisted Learning (NDPCAL) in the period 1973-77, and of the recently-launched Development Programme in Micro-electronics in Schools and Colleges. Whereas NDPCAL emphasised the development of under-graduate programmes in science and technology, however, the current programme ranges more widely and is providing a springboard for stimulating micro-computer developments in schools and FE Colleges. Priority is being given to curriculum development (in subjects such as science, mathematics, craft design and technology, business studies and technician studies), to the development of material for teacher training courses, and to improving the quantity and quality of software available to these institutions.

This widespread activity is reflected in the number of higher education institutions offering in-service courses, conferences and workshops on computers in education for practising teachers (including some aimed specifically at the FE sector). A consortium of 5 institutions (Imperial College, London; The London Institute of Education; The New University of Ulster; Bradford College; and Middlesex polytechnic) has recently been set up to develop and pilot a course on the use of computer-based learning; the course itself will consist of a structural set of materials, covering some 30-35 hours of study, that can be used either as a complete package or piecemeal by an experienced teacher, and for either local or distance learning.

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I came away with the strong impression (reinforced later in North America) that the development of Computer-based education has reached the stage where it is poised for 'take off'. Although numerically speaking the number of institutions and individuals directly involved with the use of computers for instructional purposes is still quite small, there is a nationwide development programme supported by the Department of Education and Science; the large computer companies are now firmly committed to computer-based education and training; course-ware production is becoming increasingly easy as more powerful and adaptable languages are developed; and major publishers are starting to market computer-based learning materials to schools, colleges and higher education. In these circumstances it would appear that educators at all levels will need to be adequately equipped to evaluate the worth of these commercially developed materials, to adapt them where necessary, and to develop new materials to meet their own special needs.

I firmly believe that DFE must keep developments in this key area of educational advance under close review. As in the U.K., practising teachers should be given the opportunity to develop appropriate skills through attendance at in-service courses, seminars and workshops on computers in education, and active support should be given to interested members of teaching staff wishing to design and implement computer-based instruction alongside their conventional teaching activities. This is virtually a pre-requisite if our educational systems are to adapt to the technological realities of the business and industrial worlds in which our students will find themselves living in the near future.

(3) Educational Broadcasting

I particularly wished to ascertain the extent of current use of the broadcast media for educational purposes, and therefore included in my itinerary visits to the BBC's Continuing Education Department, the Independent Broadcasting Authority's Education Department, the Open University's Community Education Section, and local radio stations at Sheffield (BBC) and Manchester (Independent).

In contrast to the situation in Australia, both the BBC and the IBA incorporate a significant adult or continuing education component in their overall educational programming, both on radio and television.

Both agencies are advised at the national level by Educational Advisory Councils. In the case of the BBC there is a separate Council for Continuing Education, composed of 34 members representing adult and further education interests, which advises the corporation on educational priorities as it sees them and comments on the production proposals submitted to it by the Continuing Education Department. It has two Programme Committees which advise on the more detailed aspects of the proposals; one is concerned with vocational programmes (eg industrial training, refresher courses, management education), and the other with programmes of a non-vocational nature (eg contemporary affairs, home and leisure interests and the arts).

The Continuing Education radio and TV departments of the BBC are under the operational control of the controller, Educational Broadcasting, who is also responsible for School radio and TV and for Open University productions. The radio and TV departments are responsible for planning, preparing and producing the programmes and any accompanying publications which have been agreed on as the result of consultations between the Continuing Education Advisory Council and the BBC. In addition, the BBC's 22 local radio stations, broadcasting on both VHF and medium wave, produce between them a considerable range of adult/further education series, many of them in cooperation with local education authorities. Each station has a named educational producer, who may be a teacher on secondment from the LEA.

Use of BBC continuing education programmes by further, higher and adult education institutions is facilitated by 'off-air' recording. All such radio, radiovision and TV programmes may be recorded 'off air' provided that the recordings are:

(a) made by a lecturer or student in the course of instruction;
(b) used for instructional purposes only in the premises where they are made;
(c) not copied for any purpose whatsoever;
(d) destroyed within 12 months of their being made.

The same rights do not apply to Open University broadcasts, which may only be recorded by registered OU students for private use in connection with their courses, or on receipt of a special licence from the University.

The IBA has one Education Advisory Council with two sub-committees, for Schools and for Adult Education. An expansion of the Council is planned for 1981, with two separate wings (again, Schools and Adult Education) and a number of specialist panels. At the time of my visit the Authority, in consultation with the Advisory Council, was drafting new Guidelines for Adult Education Programmes on television which would apply to all Independent TV companies in the transmission year 1981/82.

The ITV companies are required to include a specified educational component in their programming, currently set at a minimum of 270 hours p.a. for schools (ie 9 hours per week for 30 weeks) and 150 hours p.a. for adult education (ie 3 hours per week for 50 weeks). The situation will change in 1982, with the advent of the new Fourth Channel which will also come under the control of the IBA. From then on the weekly adult or continuing education component on ITV will consist of 2 hours per week networked on channel 1, plus 1 hour per week of local programming, and 7 hours per week (1 hour per day) on the new channel. It is stressed that all educational programming on the Fourth Channel will be in 'good' viewing hours.

Educational television on ITV is moving away from structured programmes, with greater emphasis being given to follow up, provision of support materials, and referral to adult education agencies. Each ITV company has an education section (with staffs varying in number from 1-10), and under the new guidelines will be required to employ at least one community education officer with responsibility for developing appropriate links with local adult education agencies. A significant development is that for the first time the companies will be required to transmit, as part of their educational programming, at least two general output series with an educational follow-up, the support materials for which will be produced by the local agencies. A trial programme has already commenced with Yorkshire TV, involving public libraries and museums as well as more formal agencies of adult education. On a national basis, ITV has joined with the National Extension College in developing a course based on David Bellamy's 'Botanic Man' series (now on ABC television).

As with the BBC, copyright concessions are available for ITV educational programmes. Any local education authority can take out a licence for £5 allowing any school or college under its control to record off-air any programme designated as educational, to retain it for 3 years, and to exchange it between its institutions. Universities, Polytechnics and

private schools must each take out an individual licence if they wish to record off-air. It must be noted, however, that the licence does not necessarily cover all rights in a particular programme - for example. rights to record music or archival film may need to be negotiated separately.

Independent local radio stations, unlike their TV counterparts, are not required to have a fixed educational component, but must transmit some programmes with an educational basis. These vary in scale and content from station to station, but overall there appears to have been a slow but steady increase in the volume of educational programming on independent radio.

Piccadilly Radio in Manchester, with almost 4 million potential listeners, provides a good example of the range of broadly educational activities now being undertaken. This station:

- cooperates with the City of Manchester's Education Department to present a 'call-a-course' day designed to alert listeners to the opportunities provided by further education;
- has produced a number of series (eg in 'O' level history) aimed at providing young people preparing for GCE and CSE examinations with tips and general advice on the best ways of revision, tackling questions, writing answers, etc.;
- has introduced in conjunction with the National Children's Centre, a 'Family Care Line' which seeks to bridge the gap between those in need of advice, both parents and children, and those professional agencies capable of giving it. Funded and promoted by the station with regular daily announcements, special broadcast features and posters, the service encourages listeners to ring a team of specially trained volunteers for personal advice and referral, if necessary;
- covers current issues in national politics, local government and industrial affairs, and presents short features explaining political terms and the operations of national and local government;
- radio drama and documentaries.

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I was interested to learn that the Open University's Community Education Section has collaborated with both the BBC and Independent stations in presenting multi-media courses. The Section provides both (a) short courses based on material from existing OU degree-level courses, usually of 8-10 weeks duration, and (b) general short courses related to the concerns of adults in their daily lives, covering such topics as parenting, health, employment and consumer education. The latter types of course are activity-based, presented in a magazine format, and have been prepared in conjunction with outside bodies such as the Pre-School Playgroup's Association, Health Education Council, etc.

Both types of course are supported by multi-media packages and are linked with TV and radio broadcasts. While most have been presented by the BBC, the Section has recently worked through independent radio stations in Birmingham (BRMB) and Bradford (Pennine) in presenting topics from its course 'The Pre-School Child' as the basis for a radio programme series. The Section staff compiled topics selected from the course by the two stations concerned into an activity-based booklet, provided free of charge by the stations (at their own expense) to all listeners requesting copies. Listeners receiving the booklet could then if they wished enrol with OU to take the full course (at a fee of £14, including the cost of additional support material). In Bradford the project also involved a series of articles in the local newspaper. Staff of the Section consider these projects to have been successful, particularly as a means of bringing people without an academic background in contact with OU educational programmes.

In terms of broadcast hours the OU's major involvement is with the transmission by the BBC of broadcast components of under-graduate courses. Here it is experiencing increasing difficulties with both radio and television, due to growing pressures from the BBC to resume air time for other purposes. As a result the use of radio as a delivery medium for formal instruction is decreasing, and greater use is being made of audio cassettes as an alternative delivery system (according to surveys 90% of students own or have easy access to a cassette player). With regard to television, it is believed that within the next two years it will probably not be possible to provide repeat transmissions for any programmes, as is

now usually the case. It is not considered feasible at present to substitute video cassettes for TV transmissions, although the possibility of supplying these to study centres with a replay facility is being studied. Other more innovative uses of communications technology are also being investigated (see following section).

Despite the cautionary note sounded by the OU with regard to its formal course programming, the use of the broadcast media in a supplementary or supportive educational role is markedly more extensive, and one might add more imaginative in the U.K. than in Australia. The advent of the new Fourth Channel in 1982 will provide further opportunities for educational television directed at the adult student. Given the comparable developments taking place in the U.S.A. and Canada (discussed later in this report) it would appear that the time may be opportune for Australian post-secondary authorities (such as DFE) to pay closer attention to the educational options afforded by radio and television, including a consideration of the potential use of general output series in adult and continuing education programmes.

(4) Communications Technology and Distance Education

The Open University has already acquired a world-wide reputation for its use of innovative techniques in the field of distance education. During my visit to Milton Keynes I was informed of research being conducted by OU staff into the development of an advanced electronic audio-visual system known as Cyclops which can be used by students in the distance mode.(1)

Cyclops makes use of new micro-processor technology to convert digitally a video signal into an audio signal and decode the latter back into a video signal when required. When fully developed, the system will enable handwriting, diagrams, sketches, simple animations, etc. to be displayed on a standard TV screen, but without the need for broad-band TV frequencies; instead both audio and visual signals can be transmitted by telephone lines, radio, or standard stereo-audio cassettes. In addition to a standard TV receiver, the student will require a 'black box' to decode the stored or incoming audio signal into visual signals; sound

(1) The Cyclops system is described by Dr. Tony Bates in an article in the September, 1980 issue of Educational Broadcasting International ('Applying New Technology to Distance Education').

and vision are relayed from the 'black box' to the receiver via an ordinary TV aerial socket.

The simplest and cheapest way of generating material is for the teacher or tutor to use a microphone and a light pen or electronic digitising pad; if the signals are transmitted live via the telephone, two way communication between teacher and student (or groups of students) will then be possible, provided that the latter also has a Cyclops terminal and a light pen. Alternatively, much more sophisticated use can be made of the system by means of a complete recording centre, incorporating TV camera input of still pictures, computer graphics, animation, etc.

As an education delivery system Cyclops is planned to have three distinct functions.

(i) to allow the student to replay specifically prepared cassettes through his own TV set;
(ii) to act as a visual display unit, providing students with access to a central computer via the telephone;
(iii) to provide distance tutorial systems, again via the telephone.

The system promises to be comparatively cheap. If the modems were to be manufacturered commercially the cost would be about £100 each, while even the sophisticated recording centre could be set up for little more than £3 000. Using the system in its simplest mode (ie microphone plus light-pen) teachers can generate their own material without any special training, and should be able to learn how to use the recording centre without much difficulty.

By 1980 Cyclops had been developed to the stage where it was ready for field testing. Costs of a trial involving a sufficient number of prototype machines were estimated at from £50 000 - £100 000 - too large a sum for internal funding by the University. An approach was therefore made to British Telecom for a research grant for a pilot project which would investigate the provision of distance tutorials via telephone lines to a number of the OU's study centres. If as expected these funds are forthcoming, a further two years will elapse before there is sufficient information from the field test on which to

base a decision whether or not to adopt the system on a widespread basis within the University and perhaps five years before the equipment is commercially available. Despite these inevitable delays, however, the system obviously has a great deal of interest for institutions concerned with distance education, and warrants close monitoring by DFE.

(5) Educational Technology Services

In line with my general interest in current applications of educational technology in post-secondary institutions, I visited the Instructional Technology/Educational Services Units at two large Polytechnics, Sheffield and Manchester. Such Units have been established in most Polytechnics with the general aim of increasing the effectiveness of teaching and learning in the parent institution, and usually combine technical production and utilisation services with the encouragement and promotion of new methods of teaching and learning.

The Instructional Technology Unit of the Department of Education Services, Sheffield City Polytechnic, is concerned both with the support and improvement of existing methods, and with the development of alternative methodologies, such as the replacement of lectures by the use of structured learning resources, or the use of television as an integral part of a lesson rather than as an 'add-on' component. Its courses are designed for the Polytechnic's own teachers, for teachers in local schools, and for training officers in industry and commerce. Most are 'workshop' courses providing 'hands-on' experiences in which participants learn to produce resources or design activities by do-it-yourself means with the support and guidance of qualified tutors. Course members generally have opportunities to relate course work to their subsequent practical experience through special follow-up courses in which the accent is on individualised instruction and coaching. The Unit also houses a store of resources including CCTV and other A/V aids, CAL programmes, tape/slide presentations and other programmed materials which can be inspected and used by participants.

Courses currently being offered included:

. 'Development of Self-Instructional Programmes' - concerned with the design and development of learning resources in printed, multi-media or computer-based form (5 days);

- 'Advanced Techniques in Self-Instruction' - a review of the basic authorship techniques covered by the above, and introducing the students to other programming styles and presentation systems (5 days);
- 'Training Needs Analysis' - seeking to provide criteria to use in deciding whether a specific training scheme is likely to prove cost-effective (3 days);
- 'Games and Simulations' - aiming to give participants an understanding of, and empathy for, gaming and simulation and to provide criteria for deciding when to use these techniques in their own work situations (5 days).

Other courses are more production oriented and provide training in, for example, basic TV production techniques. The Unit is also active in the field of computer-based education and training, e.g. in training authors in organisations using computer-learning languages. It has its own micro-computer which is available for use in its courses on developing self-instructional programmes and for which a variety of demonstration programmes have been developed.

At Manchester Polytechnic the Educational Services Unit operates on similar lines, but with less emphasis on in-service teaching and training, and more on the provision of equipment and production services. Courses offered in 1980 included a Teaching Materials Workshop, an A/V Equipment Workshop, and a CCTV Production Course. I was told that course numbers were limited to a total of 10 and that most courses were over-subscribed. The Unit is responsible for acquisition and maintenance of all A/V equipment in the Polytechnic, and also provides a range of resource production services; its facilities include photographic and graphics studios, a well equipped staff A/V workroom, a mobile black and white CCTV unit, and a three camera colour TV studio.

The production facilities at the Centre for Resource Development, Open College of Further Education, compare favourably with those provided in the two Polytechnics visited. However, I was impressed, particularly at Sheffield, with the commitment of resources to the conduct of inservice and external training courses in instructional design and resource development, which reinforced my view that DFE,

despite its substantial investment in equipment, has barely scratched the surface in this area. There is, I believe, little likelihood of significant change taking place in approaches to teaching and learning within the Department unless a determined effort is directed towards upgrading and extending the expertise of our own staff in the areas of resource development and educational methodology and technology.

C. Academic Libraries and Learning Resource Centres

(1) The Concept of the Learning Resource Centre in Post-Secondary Education

While in the United Kingdom I visited a Number of academic libraries, including those at the Cambridgeshire College of Art and Technology, Sheffield City Polytechnic, the Open University and Loughborough University of Technology. All of these (including the University Library at Loughborough, which was housed in an attractive new building opened a few months previously) were organised on essentially traditional lines, providing a range of materials and services in response to staff and student needs, but not playing an active role in students' educational development.

However, many of the librarians I spoke to were keenly interested in the concept of the Learning Resource Centre as a place where individual learning takes place, using selected materials and backed by tutorial assistance, and which either replaces or supplements more traditional teaching methods. This was particularly the case at Sheffield, where the City Polytechnic had recently hosted a national conference on the topic, attended by academics and librarians from Universities, Polytechnics, and Institutes of Higher Education. As a result I was able to gain much useful information from the Polytechnic's Chief Librarian, David Lewis, who chaired the Conference, and from Ms. Patsy Hutchinson, the Media Service Librarian, one of the participants.

It appears that Learning Resource Centres are developing in accordance with two contrasting models: on the one hand, where a specialised LRC is responsible for the teaching of a specific course, it is often located in and under the total control of the relevant teaching department, while at the other end of the scale the general LRC tends

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to be centrally located and staffed by librarians. Prof. Lewis Elton, Head of the Institute for Educational Technology at the University of Surrey, demonstrated at the Conference that the most appropriate location and staffing could be decided by an analysis of the functions of the LRC in question, as follows;-

Resource Centre Function	Desirable Location	Desirable Staffing
Main source of learning for a specific course (i.e: little, if any, conventional teaching)	Teaching department	Departmental
Support role to several courses (i.e; supplements conventional teaching)	Teaching department	Library
Supplementary source of learning in one general subject area (e.g: Biology LRC at Glasgow)	Teaching department	Library
Supplementary source of learning in several subjects	Library	Library

Fig. 1

Prof. Elton's research has shown that these combinations provide the most efficient use of the LRC by staff and students. Whichever model is followed, however, the need for tutorial guidance of students using the LRC has highlighted the importance of the close involvement of librarians in course development, and the need to develop the teaching function of library staff in addition to subject expertise.

Several higher education institutions have introduced LRCs at departmental level, where students are able to select learning packages containing video or audio cassette tapes, filmstrips and study guides, etc. One example of a departmental LRC is in the Department of Civil Engineering at Sheffield, where most of the material is in the form of course readings and supplementary printed matter, but there are also video cassettes and tape/slide programmes and the necessary playback equipment. The principal problem has been that of providing adequate staffing within financial constraints.

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The outstanding example of a centrally administered Learning Resource Centre replacing a traditional Library is considered to be at Brighton Polytechnic, which I was unable to visit (most unfortunately as it turned out, as this institution is also participating in the teletext trials described earlier). The Polytechnic is committed to a dynamic policy which involves LRC staff in all stages of course planning provision and course requirements.

In view of the similarity between this policy and the philosophy which has guided DFE in planning the new LRCs at Elizabeth and Gilles Plains, I sought further information on the operational structure of Learning Resources at Brighton (see Fig. 2). Each of the four main campuses of the Polytechnic has its own Site Services, consisting of library services and media services appropriate to the site. These are supported by a range of Central Services providing specialist support for site-based services and working mainly through them. Included amongst these Central Services are an Educational Development Unit providing expertise on teaching/learning methods and course design; Production Services, with a capacity to produce a range of materials from the very simple (overhead transparencies) to the very complex (colour TV programmes or multi-media teaching packages); a Technical Facilities Section responsible for the selection and purchase of major production and utilisation equipment for the libraries and media production areas; as well as more conventional Library Media Services and Technical Services.

I was particularly interested in the job descriptions which have been developed for the categories of staff in closest touch with the teaching staff, students and courses, and who are responsible for making links across the range of Learning Resources services to give the fullest possible support to the academic work of the Polytechnic. These include:

- Site Resources Officers who are responsible for the management of site library services and media facilities; for the co-ordination and overall administration of all Learning Resources revenue and capital budgets for the site; and for the development of site-based Educational Development Unit services in consultation with the EDU co-ordinator;

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STRUCTURE OF LEARNING RESOURCES, BRIGHTON POLYTECHNIC

SITE SERVICES

Providing library and media services to meet the needs of each site

EASTBOURNE	FALMER	MOULSECOOMB	GRAND PARADE
Three libraries, one AV Centre; 18 staff.	Two libraries, one TV studio and an Educational Technology Centre; 24 staff.	Two libraries and one Equipment Loans Pool; 30 staff.	Two libraries and one AV Media Unit; 16½ staff.

CENTRAL SERVICES

Providing specialist support for site-based services, and working mainly through them

EDUCATIONAL DEVELOPMENT UNIT	PRODUCTION SERVICES	MEDIA TECHNICAL FACILITIES	LIBRARY MEDIA SERVICES	LIBRARY TECHNICAL SERVICES
EDU Co-ordinator PL	Head of Media Production PL	Technical Facilities Manager SL	Media Librarian SL	Technical Services Librarian SL
4 Educational Development Assistants SL	2 Media Producers SL/PL	5 Engineers T4/5 - SO1/2	Assistant Media Librarian LII	3 Information Specialists LII
2 Educational Development Releases SL	Graphic Designer LII	4 Technicians T1/2 - T3/4	4 Resource Assistants C1/2	4 Assistant Information Specialists LI
Secretary AP2	Assistant Graphic Designer LI	Secretary AP2		10½ Clerical Assistants C1/2
	Print Assistant T2/3			
	Secretary AP2			

ADMINISTRATION AND CO-ORDINATION

Co-ordinating the work of all sections of Learning Resources and providing administrative support

Head of Learning Resources HOD VI.	Deputy Head of Learning Resources PL.	Liaison Services Officer AP4/5.	2 Secretaries AP2

Fig. 2

- Course Resources Officers, who as professional librarians are expected to know the detailed structure and educational objectives of particular courses, the methods of teaching and learning employed, and the characteristics and problems of students; to serve on the relevant course boards, committees and working parties in order to understand the course's resource needs; to be aware of all significant works, print and non-print, and sources of information for the course, and to develop the collection to its maximum level of effectiveness; and to ensure that resources are exploited fully, through the selective dissemination of information and the conduct of formal and informal instruction in their use.

- Educational Development Assistants who work directly with teaching staff, providing assistance in the preparation and review of courses, the production of teaching/learning materials and the implementation of new teaching methods, organising training workshops as and when required, and preparing training manuals. They are expected to have sound teaching experience within one or more of the relevant subject areas; experience in educational and staff development activities; and the organisational ability to keep a wide range of projects in progress simultaneously. (2)

The Brighton model provides an instructive example of the value of well-defined aims and objectives as a basis for long-term educational planning. Although it is being followed in varying degrees by several other institutions it is still uncommon to find such a high priority being given to learning resources as a key component of educational development. As the economic situation in the U.K. worsens, it seems probable that financial factors will outweigh educational considerations in deciding future progress in this area. Nevertheless, the existance at Brighton of a fully-fledged working model of a Learning Resources Centre has provided a focal point for subsequent development. Despite the increasingly restrictive economic climate in this country, I consider that establishment of a model LRC within one DFE College (necessarily on a much reduced scale, but on broadly similar lines) is needed to provide a practical demonstration of the feasibility of the concept in a local TAFE context.

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(2) Summarised from Brighton Polytechnic Learning Resources: Background Information, May 1980 edition.

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(2) Joint-Use Libraries

I had hoped to be able to visit several examples of joint-use libraries in the Community/Village Colleges of Cambridgeshire and Leicestershire, as well as the Abraham Moss Centre in Manchester. In the event, unfortunately, the British Council was unable to arrange a visit to any Village College, and I had to confine myself to a brief tour of the latter. However, I did have the opportunity to discuss joint-use developments with Mr. Arthur Jones, Senior Library Adviser in the Office of Arts and Libraries (formerly a part of the Department of Education and Science). He mentioned that the Library Advisory Council for England and Wales is beginning to assume a wider co-ordinating role across different types of libraries, and under the stimulus of economic pressures interest is growing in the concept of joint-use or dual-purpose libraries. At the moment, however, most dual services are in the schools area, and there are very few examples of public libraries operating in conjunction with Colleges of Further Education.

The Abraham Moss Centre, which I visited on my last full day in England, is probably the best-known Community Centre in the country. Located in the inner-city Cheetham-Crumpsall area of Manchester, 3-4 miles from the city centre, it includes a Secondary School (Junior, Middle and Sixth Form); an Open College providing a range of further education courses; a district Sports Centre for shared school and community use (including covered swimming pools, basketball and squash courts, gymnasium, and 'missile range'); a joint-use community library; a Creche; a Performing Arts Centre including theatre, drama studio and music suite; a Youth Wing; a small Residential Wing housing up to 12 staff and students; and an aged and handicapped people's club. It has been established on a somewhat similar basis to The Parks Community Centre, and is funded by four City Council Departments - Education, Cultural Services, Recreation and Social Welfare.

I was attached to a small group of staff and students from the Liverpool College of Higher Education who were being given a guided tour by the Assistant Principal, Mr. T. Thompson. He explained that while the secondary component is run on fairly conventional lines, the Open College has recently introduced a substantial Flexistudy

programme to supplement existing vocational studies and enrichment and adult basic education courses. The College offers through Flexistudy a range of 'O' and 'A' level subjects together with preliminary courses in English, Mathematics and study skills. Course materials are based on National Extension College courses but in some cases these have been developed and supplemented by additions from College staff. Between 50 and 60 students enrolled for Flexistudy in the first week of operation and numbers have grown steadily since. Course fees have been set at £25 - £30 per subject, covering the cost of course materials, tutorials, and the marking of assignments. The College is pleased with the response and hopes to extend the range of courses offered in the future.

The Library within the Centre is a Branch of the Manchester Public Libraries, and is open for 12 hours a day Monday through Friday, and for 8 hours on Saturday. Students use it throughout the day on the same basis as members of the public. It includes a Children's or Junior Library, with books for the recreational and study needs of children up to the age of 14, and other facilities for the very young; a Leisure Library, with the usual range of public library fiction and non-fiction books, magazines, newspapers and other materials; and a Research Library. The latter serves a dual function, providing books and other materials for the study and information needs of the community but also acting as a resource centre for the School and College at Abraham Moss. There is a substantial reference collection, a wide range of periodicals (including some microfilm sets), slides and filmstrips, records and cassettes. Photocopying facilities and quiet study areas are also provided. Much of the educational A/V equipment is centralised within the Library and available on a shared basis to be used in any part of the Centre, or by students and members of the public who wish to study in the library.

Walking through the Centre I gained the impression of a good mix of age groups in the corridors, coffee shops, leisure areas and the library. The latter appeared to be well-used, with student materials housed mainly on the upper floor and popular materials on the lower. Mr. Thompson felt that the sharing of resources benefited both the

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general and the educational community, but possibly the school and college most of all, as in normal circumstances neither could expect to have access to such a wide range of resources.

In view of the opening of the Noarlunga College and Community Library early in 1982, I was pleased to observe this example of a large public library branch operating (so far as I could tell effectively) in an educational environment. This was despite the somewhat unsuitable location of the Centre, on the boundary between middle and working class areas and away from any shopping facilities, and the placing of the Library itself at the centre of the complex at some distance from the surrounding streets. However, the presence on the site of educational, leisure, sports and other community facilities has undoubtedly helped to increase public use of the Library. In contrast, the close-to-ideal location of the joint-use Library at Noarlunga should lead to very heavy use of the facility once the community becomes aware of the services available. This in turn may well lead to a greater level of community participation in College programmes generally.

(3) Computer Systems in British Libraries

A related purpose of my visit was to examine current developments in library automation and network operation, in order to assist in planning the implementation of computerised library systems within DFE, and in clarifying the advantages to be gained by participating in shared systems with other institutions. In fact I had little time to devote to this aspect in the United Kingdom, and my examination was confined to the systems operating in the four academic libraries visited (i.e. the Cambridgeshire College of Art and Technology, Sheffield City Polytechnic, the Open University, and Loughborough University of Technology). I was able to pay considerably more attention to this important area in the United States and Canada.

All four libraries provided computer search facilities, with a computer terminal linked to the principal computerised data bases such as Lockheed-DIALOG. Technical processes such as the circulation system and cataloguing were automated in three of the four, and I

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was able to confirm that this is now common place in most larger academic libraries, as well as in many public library systems. Like the National Library of Australia, the British Library is actively developing a national shared cataloguing and information system which will offer cataloguing data to participating libraries, and this is accelerating the trend to automation and networking.

There has been tremendous change in recent years in the provision of computerised information retrieval systems. As noted above, the four libraries visited provided dial-up on-line search access to several of the major commercial and national data bases, and reported a steadily growing demand for these services by teaching and research staff; despite the economic stringencies, there is a general expectation that this will continue and increase. The inauguration of Euronet-DIANE (Direct Information Access Network for Europe) in 1979 widened the scope of services available to British users, and will eventually provide some 150 data bases to users via the international telecommunications networks. Euronet's U.K. services were opened in April 1980, with 13 computers acting as hosts to more than 100 data bases, and 140 customers using the system.

(4) Library Research and Development

As my itinerary included Loughborough and Sheffield, I took the opportunity to visit two of the research units funded by the British Library Research and Development Department: the Centre for Library and Information Management at Loughborough University, and the Centre for Research in User Studies at Sheffield University. I also investigated two other projects supported by the British Library at Loughborough: the appointment of an Information Officer for User Education, and the proposed publication of an electronic journal.

The Centre for Library and Information Management (CLAIM) has as its overall aim 'improvement of the effectiveness of services to users through the provision of information, investigation, continuing education and consultancy services in the field of library and

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information management.' It has a full-time staff consisting of a Director, an Information Officer, three Research Fellows and two secretarial assistants. Three visiting Research Associates, all from Australia, worked with the Centre for varying periods in 1977, 1978 and 1979.

The programme of investigative work is grouped into four main areas which reflect the needs of library managers at the present time, viz.:

(a) decision making within systems;
(b) costs of library and information service operations;
(c) people at work;
(d) techniques and tools for managers.

One project under consideration which promises to be of considerable interest to the Department is a case study of the amalgamation of library systems, in this instance the proposed establishment of a joint polytechnic/public library by a local education authority. At the time of my visit agreement was being sought on terms of reference for the study.

The Centre for Research in User Studies (CRUS) is located at the University of Sheffield. Its basic aims are to help improve the methodology of studies of users of library and information services, and to help effect the comparability and cumulation of results. Its current staff consists of a Director, an Information Officer, two Research Officers, two Research Assistants and a clerical officer.

The research under way at the Centre falls into several distinct programme areas:

(a) information needs of the general public;
(b) information needs of humanities scholars;
(c) a study of applications made for inter-library loans in the humanities (a new programme investigating the sources from which scholars obtained references);
(d) a schools programme (including a longitudinal study of young people's reading, and a study of library use by 6th form students);

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(e) information needs of undergraduates in economics (a longitudinal study aiming to discover discrepancies between lecturers' expectations of students' use of sources and the latter's actual behaviour).

Although research is the biggest single component of the Centre's work, it also provides an information service on user studies, and maintains a collection of reports together with a comprehensive computer-based index of user studies; it offers advice and consultancy services, and will undertake studies for other bodies on contract, and conducts a limited education and training programme.

The Information Officer for User Education, Mr. Ian Malley, is located in the University Library at Loughborough. His position is funded by the British Library R. and D. Department, and he has responsibility for collecting and disseminating information on user education activities on a national basis. This is achieved by:

(a) visiting other institutions in the U.K. to collect information on their own programmes and to advise on possible extensions or improvements;
(b) producing a newsletter to report on relevant activities at home and abroad;
(c) partaking in and promoting courses and seminars;
(d) initiating and maintaining contacts with relevant professional groups and research projects in the U.K. and overseas;
(e) providing an inquiry service to institutions;
(f) establishing and operating a Library Instructional Materials Bank (containing a comprehensive collection of print and non-print materials used in user education programmes in a wide variety of libraries).

I had met Mr. Malley during his visit to Australia in 1979, and was pleased to have this opportunity to discuss with him the 'state of the art' in the U.K. I was particularly interested in the Library Instructional Materials Bank which he has set up with

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the dual functions of providing a service and attempting to improve the standard of materials produced. The range of materials is broad and includes course outlines, library competence tests, and programmed instruction as well as the usual subject and general library guides. Mr. Malley commented that the Bank has enabled many librarians to build new user education courses from scratch in a very short time drawing on the materials and experience available from other institutions.

The Electronic Journal project is also supported by a British Library grant, totalling £134 000. The Library is concerned to establish the potential of electronic communications networks to enable people to exchange information, views and ideas by means other than paper and the spoken word, and to assess the problems, costs and effectiveness of using them as alternative media of information. In the first project in this programme, the Department of Human Science at Loughborough is investigating the problems concerned with the preparation of an electronic journal - i.e. using a computer to replace the usual procedures whereby a scholarly article is written, refereed, accepted and published. With the aid of suitable software, an author may enter the text of the article online to the computer, and the editor, referees and ultimately the readers, as well as him/herself, will have access to the text at their terminals. Appropriately enough, the title of the experimental journal will be 'Computer Human Factors', and it will be concerned with the interaction of people with computers from either a computing or human science viewpoint.

The variety and scope of research underway in the library and information science field was most impressive, all the more so when compared with the paucity of similar studies being conducted in Australia. There was obvious concern that government cut-backs would impinge on this area in the near future, with the possibility of some existing programmes being severely curtailed. Nevertheless, the achievements to date have been substantial, and I believe that Australian librarians can benefit substantially from the British experience with regard to library management,

user studies and user education. In the longer term, the results of the electronic journal project at Loughborough may conceivably bring about significant changes in the forms of scientific and technical communication, with all that that implies for the future role and functions of our larger academic libraries.

III UNITED STATES OF AMERICA

I arrived in the United States on Wednesday 12 November, and stayed in Washington, D.C., until Tuesday 18 November, when I left for Chicago. I flew from Chicago to Toronto on Saturday 22 November, and remained in Canada until Sunday 7 December, when I left Vancouver for Seattle, Washington State. The following Sunday I flew to San Francisco, staying there until Friday 19 December when I commenced the flight back to Australia. During my 22 days in the U.S.A. I visited the following agencies, professional associations and institutions:-

Washington, D.C.

International Communication Agency
Association for Educational Communications and Technology
Joint Council on Educational Telecommunications
National Public Radio
Public Broadcasting Service
National Association of Educational Broadcasters
Academy for Educational Development
Corporation for Public Broadcasting

Chicago, Ill.

American Library Association
College of DuPage, Glen Ellyn, Ill.
William Rainey Harper College, Palatine, Ill.
Chicago Public Library
University of Chicago

Washington State

Tacoma Public Library
Washington State Library, Olympia
Pacific Northwest Bibliographic Centre, University of Washington, Seattle
KCTS-9 Public Television Station, Seattle

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San Francisco, California

Far West Laboratory for Educational Research and Development, San Francisco
Stanford University, Palo Alto, CA
DeAnza College, Cupertino, CA

As Cabinet approval for the North American component of the tour was not given until after I had left Australia, I was unable to finalise my itinerary before arriving in the United States. I am therefore particularly grateful to Ms. Helen Davis, Program Officer of the International Communication Agency in Washington, and Dr. Julie Virgo of the American Library Association in Chicago, for their assistance in arranging the above visits at very short notice.

A. General Impressions

The American presidential election had taken place the week before my arrival, and the result was still a lively topic of conversation in Washington. Many of the people with whom I spoke were concerned at the likely effects of the new administration's policies, and anticipated reductions in federal support for programmes in such areas as education, libraries, and public broadcasting. As I travelled west I was to find that this concern was by no means limited to federal government policies, as many state and local governments had already introduced, or were in the process of imposing, comparable economies. That these were already having a marked effect was apparent, for example, in Seattle, where the local press and television news carried reports that Community College enrolments in vocational courses would be reduced by up to 20% as a result of state government cutbacks.

Concern at the continuing high levels of unemployment, particularly among the black and Hispanic communities, was widespread. It was depressing to drive through the inner-city ghetto areas of Chicago and see the large number of boarded-up, burnt out and derelict dwellings (remaining in some cases from the riots of the 60's), and to contrast these with the opulence of the downtown shopping centre and the condominiums on the shores of Lake Michigan. It was no surprise that feelings of tension between the black and white communities seemed far more palpable here and in Washington than

in San Francisco, where admittedly I arrived the week before Christmas, the sun was shining brightly and the city was enjoying its warmest December on record.

In all four cities (Washington, Chicago, Seattle and San Francisco) I made a point wherever possible of listening to public radio or watching public television programmes. Several well-known BBC series were appearing on television, including 'All Creatures Great and Small' and Magnus Magnusson's 'The Vikings'; most attention however was being paid to Prof. Carl Sagan's series 'Cosmos', widely regarded as public broadcasting's first 'blockbuster'. Although the standard of local programming varied somewhat from city to city, overall the public channels provided a very acceptable and most welcome alternative to the viewing fare provided by the commercial stations.

I was also impressed with the standard of public radio, which has been credited with bringing about a 'radio renaissance' in the United States. This has been due in part to the proselytising efforts of National Public Radio (see 'Educational Broadcasting' below) and in part to effective programming by individual stations responsive to the needs of their local communities. From this listener's point of view the end result was akin to a combination of the ABC and 5UV which made for enjoyable and informative radio.

B. Educational Communications and Technology

(1) National Organisations

My main purpose in visiting Washington was to meet senior staff in the various agencies and national associations, concerned with applications of communications technology and use of the media in education, which have their headquarters in the national capital. My first visits were to the Association for Educational Communications and Technology (AECT), where I talked with the Executive Director, Dr. Howard Hitchens, and to the Joint Council on Educational Telecommunications (JCET), where I met the Executive Secretary, Mr. Frank Norwood.

The Association for Educational Communications and Technology is a professional association (with a membership of approx. 8 000) devoted to the improvement of education through media and technology, and

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is particularly concerned with fostering professional development in this area. It has a federal structure, and is organised in eight Divisions: Information Systems, Telecommunications, Research and Theory, Instructional Development, International, Industrial Training, Educational Media Management, and Media Design and Production - all areas which are pertinent to the work of the Educational Resources Branch.

Dr. Hitchens considers that use of the media to facilitate and improve the learning process is now well embedded in all levels of public education - primary, secondary and community colleges - but is less so in higher education, particularly in the major universities. A recent development in some states (e.g. Illinois, Michigan and New York) is the establishment of regional Bureaux of Co-operative Educational Services (BOCES) by neighbouring Education Districts to provide in-service training, instructional design and resource development services, and logistic services (such as film and video libraries, AV equipment maintenance and/or purchase, etc.) to schools and colleges within each region.

The Association has an active interest in exploring the full potential of applying new technology to learning, and is closely monitoring developments in cable television, mini-computers and the video disc (see Sections (2)-(4) below). According to Dr. Hitchens, the most immediate impact on education is likely to be provided by the micro- and mini-computer; the market is growing rapidly, and the industry expects to sell one million units (from programmable pocket micros to sophisticated desk-top models) on the domestic market this year at prices ranging from US$300 - US$6 000. The video disc is still being test marketed and progress is likely to be delayed by the emergence of two competing and incompatible systems.

AECT's professional development programme includes an annual convention, continuing education workshops, and the publication of a newsletter, specialist monographs and three professional journals ('Instructional Innovator', 'Educational Communication and Technology Journal', and 'Journal of Instructional Development'). In view of the access those publications provide to comprehensive information on educational media and technology, I believe that the Department could gain significant benefits from taking out corporate membership of the Association.

The Joint Council on Educational Telecommunications is not itself a professional association, but a consortium of some 20 non-government associations and non-commercial broadcasting bodies. Its members include the Corporation for Public Broadcasting, the Public Broadcasting Service, National Public Radio, and the American Library Association. First set up in 1950 as the Joint Council on Educational Television, its present role is to serve its members and the educational community at large as a monitor of new developments in communications technology and of emerging telecommunications policy; a prime concern is to ensure that government policy decisions take account of educational needs.

The Council's Executive Secretary, Mr. Norwood, believes that it has played an important part in shaping the development of public broadcasting in the United States, and has helped to ensure the reservation of domestic TV channels and secured frequency allocations in space for educational purposes. Its centre of activity has been and remains in regulatory policy, where it acts as an informed pressure group, filing comments whenever appropriate with the Federal Communications Commission. It also works closely with NASA on new technological developments in space.

Telecommunications technology, in Mr. Norwood's view, provides the means to extend the reach of campus and classroom: where the satellite breaks the barrier of distance, video breaks that of the classroom. He considers that the communications satellite is likely to become a major force in continuing education, although technical, economic and policy constraints may make direct satellite-to-home broadcasts unlikely in the near future. Satellite broadcasting to receivers located at colleges, schools, hospitals etc. is already at hand, however, and tele-conferencing using one way video and return audio is now relatively commonplace. Using public broadcasting service facilities (with some 60 stations licensed to higher education institutions), centres in all parts of the country can be involved concurrently in a teleconference. Costs can be relatively cheap - no more than US$300 per daytime hour using a leased satellite transponder.

In addition to discussing emerging technologies such as cable television and the video disc (see below), Mr. Norwood mentioned an educational application of FM radio which I found of considerable

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interest. This is the ability of FM radio to transmit a second, private programme via SCA (Subsidiary Communications Authorisation permit) sub-channel. Where commercial FM stations use SCA's to transmit background music to subscribing restaurants, hotels, offices, etc., where they can be heard with the aid of specially adapted receivers, a number of public stations are using them to provide special audience services such as 'talking newspapers' for the visually handicapped, or continuing education for specific professional groups (e.g. the medical profession). SCA channels may also be used to transmit data, facsimile, and even slow-scan (still frame) television. It is an application which appears to merit further investigation in this the International Year of the Disabled Person.

(2) The Video Disc and Interactive Video in Education

Four new technologies are creating the framework for a revolution in communications which many writers consider will profoundly affect social and economic life before the end of this decade - the video disc, cable television, the microcomputer and the communications satellite. Although still in their early stages the implementation of these new technologies is most advanced in North America, and I looked forward to observing the systems in use and assessing their potential applications in education and training.

The arrival of the video disc has been eagerly awaited by educational technologists because of its special recording capabilities. The optical video disc system (which is the one of greatest interest to educators) has a storage capacity of 54 000 frames on each side, each of which can be individually located and displayed at normal speed, in slow motion or as a still frame. Still frames can be displayed on the screen for an indefinite period of time without wear or tear to either the disc or the player, as the disc is read by a low-power laser beam. The resolution is excellent (up to six times the density of video tape) and manufacturer's tests have shown that the reliability of disc playback equipment is 2-3 times better than that of the corresponding tape equipment.

Also of particular interest is the fact that the video disc will store and display with equal facility film and TV programmes, 35 mm. slides, microfilm, printed text from books and newspapers, computer

printouts, etc. Two discrete audio channels are available to provide a stereophonic sound capability, or to allow the audio to be recorded in two separate languages which can be played back independently. Still frames, slow motion, normal speed sequences and aural commentaries can be combined in any required sequence on an optical disc.

The storage capacity of the optical video disc is immense; for example, the entire contents of the Encyclopedia Britannica could be stored on part of one side of one disc. Two more practical examples are proposals by NASA's Jet Propulsion Laboratory to store planetary information sent by spacecraft from deep space on video disc instead of microfiche (with one disc replacing 1 500 - 1 800 microfiche); and by Canada's Public Archives to store its various types of records (including prints, paintings, drawings, photographs, documents, maps and motion pictures) on disc. Information regarding the content and location of each frame is stored on a mini-computer, and access is provided via a small intelligent terminal. Trials of the system have shown that the average time taken to randomly access any frame is about 2.5 seconds, with the slowest search taking about 4 seconds. However, it is the possibility of linking an optical video disc player with an external microcomputer which is generating most excitement in the educational community. Such a combination can produce a very powerful stand-alone computer-based education system, with a capability limited only by the size of the computer memory. Peripheral disc drives or audio cassettes can be used to store a large number of student programmes and student response data, while the full logic capability of the computer is available to provide sophisticated branching strategies. Finally, the computer can also be programmed to accept and process natural language responses from the user

A number of educational video disc projects are currently under way in the United States, many of them combining video disc players with microcomputers as described above. One of the best known is the Videodisc Innovations Project (VIP) at Utah State University, where researchers have developed an experimental instructional disc incorporating segments on nutrition, welding, family life, care of sheep, special education, physics, and use of the library. Other projects focus on the development of interactive simulations - i.e. the representation of a complex real phenomenon or system by a simplified but realistic model. The combination of the visual

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and sound capabilities of the video disc with the dynamic graphic and processing capabilities of the micro-computer is particularly well suited for this type of interactive instruction.

Despite the extent of the investigative work already under way, and the large number of anticipatory articles which have appeared in educational technology journals in the past 2-3 years, both Dr. Hitchens and Mr. Norwood sounded a cautionary note regarding the adoption of this technology by educators in the near future. The main problems, in their view, were (a) the emergence of several incompatible formats; (b) the necessity for competing manufacturers to develop a viable consumer market; and (c) the extremely high cost of developing instructional software for the educational market.

There are now at least four incompatible playback systems competing for a share of the market. Two of these are optical, using laser beam technology, and two capacitive, using a stylus pick-up similar to those of audio record players. There is also a clear dichotomy in development between the consumer models (which aim to provide users with a low-cost device for replaying pre-recorded discs containing popular film and television programmes) and the institutional models (which offer sophisticated technical capabilities such as random frame selection, still frames, and the availability of interactive programmes).

I attended a demonstration in Chicago of the Pioneer VP-1000 Laserdisc player (retail price approx. US $800) which makes use of advanced laser and electronics technology developed by MCA and Philips. Although intended for the consumer market, it offers a variety of playback modes, including slow speed and freeze-frame, and employs a built-in microcomputer to provide fast random access to any portion of the material stored on the disc. It can therefore be readily adapted for educational and training purposes, provided that appropriate software is available. Most discs currently on sale are recordings of popular feature films, such as "Jaws" and "Saturday Night Fever", but a variety of special interest and 'do-it-yourself' programmes are now being released, covering such activities as concert performances, cooking, golf and tennis lessons, routine car maintenance, etc. The Tacoma Public Library which I visited while in Seattle, owned an MCA Magnavox player, which also utilises the Philips laser beam system, and reported that its

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borrowers were more interested in its feature films than in general educational discs.

The mass consumer market envisaged for the video disc has yet to eventuate. At the time of my visit sales of optical disc players were reportedly lagging, while the first of the capacitive players (RCA's Selectavision system retailing at approx. $500) had not been generally released. On the other hand, sales of video cassette recorders were said to be booming, with an estimated 1.3 million players sold in the U.S. by mid-1980, and surveys have shown that the ability to record TV programmes off air is the most important reason why customers buy the equipment. At least until such time as an extensive and varied library of software is generally available at a competitive price, the existence of a large consumer market for the video disc is therefore open to question.

Hardware costs are less significant in the institutional market, where the versatility and interactive capabilities of optical disc systems provide great promise for improving the efficiency and effectiveness of education. Here the major inhibiting factor is likely to be the very high cost of software development, particularly for those applications linking the disc player with a microcomputer in an interactive learning mode. While this may well tend to slow down development, the potential benefits are such that I find it difficult to believe that the promise of video disc/microcomputer technology will not be realised in due course. It is not at all improbable that, as with video cassette recorders, the creation of an educational/institutional market will precede rather than follow the establishment of a viable consumer market. It is important, therefore, that the Department should remain abreast of technical developments in this very fluid field, and should commence educational trials with optical disc players as soon as suitable models (such as the Pioneer VP-1000) become available on the local market.

(3) Micro-computers in Education

In the course of such a brief visit it was not possible for me to observe in any depth the various applications of micro-computers in education. It was clear, however, that these applications are presently far more extensive in the United States than in South Australia, and appear to be receiving considerably more attention in post-secondary institutions. It was interesting to note, for

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example, that the academic libraries/learning resource centres which I visited in the U.S. and Canada provided student access to computer terminals and/or micro-computers as a matter of course. The Chicago Public Library also had PLATO terminals available for use by community borrowers, as part of a Study Unlimited programme operated in conjunction with the City College of Chicago.

It is no doubt still the case that the majority of students and teachers in the U.S.A., as in the U.K., have yet to use a micro-computer as an educational tool. Nevertheless, there is clear evidence that the spread of these devices in schools and colleges, and in the community at large, is increasing rapidly, and educators are placing a correspondingly high priority on learning about computers and how to use them in education. Their use as an aid to learning can be conveniently considered under the following broad headings:-

(a) learning about the computer;
(b) learning through the computer;
(c) learning with the computer;
(d) learning support systems.

Learning about the computer, or computer literacy, is the most rapidly-growing area of computer-based education. The feeling is widespread that in the near future the computer illiterate will be as socially and economically disadvantaged as the print illiterate is today - success in a growing number of jobs will depend on an understanding of the applications of computers in the academic, business and industrial worlds. A computer-literate person will know when the use of computers is appropriate and will be familiar with the ways in which they can be used in particular situations.

Computer literacy courses are found in many schools and colleges. Typically, they incorporate some knowledge of computer programming, problem solving, applications in various fields, computer system components, and the impact of computers on society. Thus DeAnza College in Cupertino, CA, (in the heart of Silicon Valley), offers short courses on 'Introduction to Micro-computer Systems for the Small-Business Person' (8 x 2 hour sessions) and 'Personal Computers:

how to use them - what they can do' (6 x 2 hour sessions). Professional development with regard to computer use is widespread, and many professions (such as architecture, engineering and law) which are increasingly reliant on computer assistance and automatic information processing provide special courses and institutes for their members, often in association with academic institutions.

In-service training of teachers is considered to be essential if public education is to catch up with the rapid changes in technology. At the Far West Laboratory for Educational Research and Development in San Francisco I spoke with Mr. Paul Christensen, who had recently completed a major study of the educational use of microcomputers in schools in the Bay area. He told me that teachers are filling virtually every course they can find which would help to train them to use computers in their work. His research showed that in most cases local teachers were concentrating on improving computer literacy, developing thinking and problem solving skills, and on encouraging students to use the computing and data processing capacities of the micro-computer to aid them in their learning. Little use was being made of micro-computers to present curriculum content or to support classroom management functions.

Learning through the computer by means of drill and practice programmes, diagnostic testing and question and answer tutorials is a familiar application of computer-assisted learning, and continues to be central to many of the larger operational U.S. systems (e.g. the PLATO system of the University of Illinois and Control Data Corporation). It is likely to remain a major application, although its relative importance appears to be declining as a result of the dramatic growth of computer literacy courses and of the greater flexibility offered by the wide-spread availability of inexpensive, portable mini/micro units with significant computational power.

Learning with the computer is taking on new dimensions with the advent of the micro-computer. Current uses include computer-aided learning (CAL), simulation and gaming, problem-solving, and to a lesser degree creative activities such as computer-aided design and music composition. This mode of learning is attracting attention

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in government, industry and the military because of the opportunities provided for large-scale self-instruction and its potential cost-effectiveness in relation to other forms of instruction. The Boeing Aerospace Company in Seattle, for example, has developed a computer training programme which covers the spectrum from concepts and digital electronics fundamentals to complete systems, and which makes use of a variety of methodologies - classroom instruction, videotape, audiotape, computer-assisted instruction and programmed texts. Several Boeing learning centres in the Seattle area provide job-related training during working hours and career development opportunities at other times. Courses may be in traditional classroom settings, or be delivered completely by mediated courseware, or be a combination of the two approaches.

The same materials used for group instruction are also available for independent study, either on videotape in the learning centres or on audiotape that employees can take home. Personal computers in carrels at each of the learning centres provide independent learners with the opportunity for hands-on experience. This year (i.e. 1981) it is planned to introduce a pilot programme allowing students to access computers by telephone from their own homes. A number of portable terminals have been purchased and will be able to be borrowed for home use. A student who has problems will be able to dial a Boeing instructor for advice. It is considered that this mode of study will become more popular as rising transportation costs encourage greater use of car pools and public transport.(3)

Learning support systems include such aspects as computer-managed instruction (CMI), information management, student guidance and the automatic generation of learning and testing materials. At present CMI applications predominate in most training programmes because they are more straightforward and less costly to implement than CAL, while still providing such specific benefits as (i) reduction of instructor time spent on clerical activities; (ii) uniform and consistent testing; (iii) monitoring of student performance; (iv) individualisation of instruction; and (v) provision of test security, with immediate feedback of test results accompanied by prescriptive or remedial work if required.

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(3) summarised from a paper by T. Clogston in the September 1980 issue of Instructional Innovator ('Case Study/Application: CBI for a High-Tech Industry')

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There is little room for doubt that during the 1980's mini/micro-processor systems will come to dominate production and administrative processes in most technical industries, affecting the great majority of employees. Boeing is but one of many major companies that has recognised this fact of economic life and has adapted its vocational training programme accordingly. In Australia the TAFE Sector in particular cannot afford to ignore the nature of the technological transformation now taking place in industry and society. Planning to accommodate these changes in TAFE educational programmes, curricula, and delivery systems needs to be undertaken as a matter of urgency. Specifically, the DFE should give immediate attention to the development of computer literacy components for inclusion in all relevant course areas; to the provision of in-service training of teachers in computer-assisted instruction; and to detailed investigation of the potential applications of micro-computers in education and training. This latter will need to include an assessment of the major problem that is still inhibiting the use of the micro-computer as a comprehensive, cost-effective, individualised delivery system - the high cost of developing software that is of acceptable quality and adequately presents new curricular material.

(4) Cable Television and its Educational Potential

The growth of cable television in the U.S.A. during the past few years has been dramatic. At the end of 1980 there were an estimated 18.7 million subscribers (or nearly 24% of television households), with almost half of these taking one or more pay TV channels. On present indications there will be at least 30 million homes subscribing to cable service by 1985. In Canada the proportion of TV households taking cable service in major cities such as Toronto and Vancouver already exceeds 50%.

These figures are of more than academic interest to Australians in view of the Commonwealth government's policy decision in July 1980 to approve in principle the introduction of cable and subscription television, and its direction to the Australian Broadcasting Tribunal to conduct a public Inquiry into how this might best be done. The Terms of Reference for the Inquiry have subsequently been modified and it is now to address the question of whether cable and/or subscription television services should be introduced at all, and to comment on the potential roles and purposes of such services in considering whether and how they might be introduced.

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My reading had indicated that U.S. Federal Communications Commission rules required that all cable systems serving more than 3 500 households should provide at least four channels for various types of local programming, including one for "educational access", with no cost for the use of the system, and I was interested to find out what use was being made of this potential resource for open learning. (In fact, it transpired that the FCC no longer requires cable licensees to provide public access channels, but this has had little effect in practice as most systems operate under a local franchise which specifies exactly how many public access, educational and other channels must be provided.)

Relatively little use appears to have been made of cable as an alternative delivery system, although Purdue University in Indiana and Oregon State University have used it to deliver a variety of course offerings to off-campus students. Mr. Norwood of the Joint Council on Educational Telecommunications believes the growth of pay cable could provide an opportunity for the development of open learning courses by enabling educational providers to tie fees directly to viewership, but I did not come across any operational examples. However, two of the Community Colleges I visited were actively engaged in planning to use cable as an additional means for servicing the educational needs of their local communities, and I was able to discuss their proposals with senior staff members.

At William Rainey Harper College in Palatine, Illinois, on the north-western outskirts of Chicago, I spoke with Dr. George Voegel, Dean of Educational Services, who had chaired a Committee set up by the College and eight local School Districts (i) to study the educational issues involved in cable television, and (ii) to make recommendations to local municipal authorities on the educational requirements which should be incorporated in any cable TV franchise agreements awarded by the municipalities concerned.

The Committee's report, issued shortly before my visit, recognised the "tremendous potential" of cable television for educational purposes, and recommended that the franchise should specify that "an initial minimum of 5 educational channels (1 channel/1 way; 2 channels/2 way; 2 channels/2 way data lines) be dedicated to

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schools within the institutional network for the duration of the franchise". The licensee should be required to provide regional production facilities and mobile production units to accommodate the needs of community and institutional users. Programming on the educational channels should include live and pre-recorded programmes for school use during the day; live and pre-recorded programmes for adults in the evening; and transmission of student accounting information and administrative data at all hours.

Dr. Voegel considered that Harper College itself would be a production site, as existing facilities in the Learning Resource Centre included graphics, photographic and TV production studios. Other possible sites included schools closed due to declining enrolments, or empty stores in shopping centres, which could be re-developed as community access TV centres. A co-operative or consortium of educational authorities, possibly in conjunction with other agencies such as park districts and public libraries, to sponsor programme development and production was envisaged.

Although no decision had yet been made regarding the issue and content of the cable TV franchise for the area, I was impressed by the detailed examination of the educational issues by the Committee, and by the co-operation existing between the Harper College and the School Districts in its area. The area is reputedly amongst the most affluent in the country, and therefore is better situated than most to provide the financial support necessary to implement such a proposal.

The second College to be closely involved with cable television planning was De Anza College in Cupertino, California. Mr. George Sloan, Dean of Instructional Services, informed me that the College was about to conclude an agreement with a local cable company which had recently been granted the franchise for the district. It is proposed that the College will provide land, buildings and warehouse space, and will act as the originating point for local programming. In return the cable operator will provide studio equipment and staffing for the facility, and will allow access to production and editing equipment for class projects. Of the 54 cable channels which will eventually be provided, 4 will be reserved for educational use.

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Mr. Sloan said that the College is also seeking a licence for two Instructional Television Fixed Service (ITFS) channels and one UHF or VHF channel for educational broadcasting. He considered that cable television and broadcast transmissions offered the following potential uses and benefits to the College:-

(a) the possibility of communication with some 15 000 Cupertino cable households by 1982 with a total population of 52 000;

(b) direct broadcasting to local High Schools with a student population of 7 200;

(c) direct broadcasting of specific programmes to special populations (e.g. business courses to business and industry);

(d) extended telecourse offerings for credit to students wishing to study at home or who are unable or unwilling to attend courses on campus (e.g. disabled students, shiftworkers, etc.);

(e) reinforcement of the College TV instructional programme enabling TV students to gain practical work experience;

(f) promotion of television as an instructional medium among instructors and students;

(g) simultaneous sharing of lectures and classroom demonstrations at a number of different locations;

(h) facsimile transmission of library print and non-print materials to off-campus sites;

(i) group and individual teleconferences between De Anza and other Colleges;

(j) collaboration with local government, public libraries, and other community organisations to foster local origination of TV programmes.

Both De Anza and William Rainey Harper Colleges are located in affluent middle-class areas and serve communities with a heavy involvement in high-technology industries. It is perhaps to be

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expected, therefore, that despite cutbacks in education funding these Colleges should be prepared to accept the cost of educational innovation as a demonstration of faith in the ability of technology to improve instruction and provide better service to their communities. In the final analysis, however, educational as well as cost effectiveness will determine the extent to which a new technology is adopted, and applications of cable television in Colleges such as these will be closely studied by other potential educational users before the decision is made to discard present delivery systems in favour of the new.

(5) Educational Applications of the Communications Satellite

Another new technology contributing to the communications revolution is the geostationary communications satellite. Before 1970 only INTELSAT had operational satellites in orbit, but during the 70's Canada, the United States of America, the USSR and Indonesia all launched domestic satellites. Australia is now actively planning a domestic satellite system which is scheduled to be operational by 1985. I was therefore anxious to ascertain during my visit to North America to what extent educational agencies in the United States and Canada were using satellite communications as a delivery system.

In the U.S. the most extensive use has been in the 13-State Appalachian region, where the Appalachian Education Satellite Program (AESP) was first established in 1974 to provide a service to rural communities. Following a review of its operations in 1978, the AESP concluded that the program had made a substantial contribution to social and educational development in the area, that it should be continued, and that the most cost-effective distribution system was via commercial satellite, cable TV distribution. In 1979 the AESP was replaced by the Appalachian Community Service Network (ACSN), which has been set up jointly by the Appalachian Regional Commission and the National Institute of Education as a non-profit organisation to meet community needs through the distribution of a variety of educational, informational and instructional programmes via satellite.

In Washington I spoke with Dr. Heather Hudson, Director of Telecommunications Applications, Academy for Educational Development, who has had considerable experience in distance education projects

using satellite communications. She was able to provide me with detailed background information regarding ACSN operations and programming.

The Network's programming is designed to be non-competitive with the Public Broadcasting Service and commercial television, and is intended to provide specialised and/or under-served audiences with increased programme diversity and frequency. Continuing surveys of community and cable interests are used to help the Network identify community needs, secure quality programmes that fit these needs, and provide outreach and support activities for these programmes within the communities served. Where necessary, appropriate technical assistance and support is provided to local cable operators in their technical planning and implementation.

In addition to producing its own programmes, ACSN produces programmes jointly with other organisations to meet specific needs, and acts as a distributor of quality community service programmes developed by other sources. In September 1980 the Network was distributing a minimum of 64 hours of programming per week in a variety of formats, including:

. graduate and under-graduate telecourses for credit
. adult basic education programmes
. professional development courses
. workshops and seminars
. teleconferences
. general community service programmes.

A high proportion of the instructional programming includes a live interactive format using toll-free telephone lines that permits direct viewer participation.

A notable aspect of the Network's operation is the co-operative links that have been established with colleges and universities, not only within the Appalachian region, but on a national basis. Arrangements with these institutions have encouraged the enrolment of the non-traditional student to whom this type of course would not normally be available. During 1980, for example Ohio University offered four ACSN telecourses for graduate/under-graduate credit,

with options for continuing education units, certification and non-credit; in addition, five workshops, a seminar, and two national telecourses distributed by the network were included in the University's lifelong learning programme. All told, more than 50 academic institutions now offer various ACSN courses, and a growing number of professional associations are providing certification to members participating in ACSN courses and workshops.

Dr. Hudson believes the Appalachian experience has demonstrated the viability of using space technology for specifically educational purposes. Government recognition of the effectiveness of this approach came in July 1980 in the form of a US$400 000 grant by the National Tele-Communications and Information Administration to ACSN to enable the latter to expand its current network and extend its programming to include national public service applications. It is proposed to use the grant to demonstrate such applications as open and closed circuit telecommunications and national call-in programmes. Although the impact of the Reagan Administration's financial policies on future development remains to be seen, ACSN is now virtually self-supporting and should be able to continue its role as a public service organisation providing a unique combination of educational and community programmes. As such, it provides an interesting model of an alternative delivery system which will merit closer observation as Australia moves into the Space Age.

(6) Educational Broadcasting

In addition to assessing the educational potential of the new communications technologies, I was equally concerned to observe the uses being made of the established broadcast technologies of radio and television. In Washington I visited the headquarters offices of several national broadcasting agencies - National Public Radio, the Public Broadcasting Service, the Corporation for Public Broadcasting, and the National Association of Educational Broadcasters. Subsequently I visited a College-based community radio station at the College of Du Page outside Chicago, and a public TV station at Seattle.

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Despite some unease regarding levels of government support for public broadcasting following the defeat of President Carter (currently the non-commercial sector receives about 30% of its revenues from Congress), the people with whom I spoke were mostly optimistic about the future of educational radio and TV. The Annenberg Foundation had recently announced a massive grant of US$150 million to support the establishment of an American-style "University of the Air", based on the public radio and TV networks. As a result educational programming was about to receive a very substantial boost, and planning to expand the use of the broadcasting media for instructional purposes was well advanced.

National Public Radio (NPR) is a private, non-profit corporation established by public radio stations in 1969 to "acquire, produce and distribute radio programmes to be broadcast over non-commercial educational radio broadcast stations, networks and systems". Following amalgamation with the Association of Public Radio Stations in 1977, it now has the further role of representing public radio before the executive and legislative branches of government. Its main source of funding is the Corporation for Public Broadcasting, which allocates the public broadcasting budget authorised by Congress. Additional funds are provided by corporate underwriting, private foundations, dues from member stations, etc.

Currently NPR has 189 members operating some 237 stations offering informational, cultural and educational programmes geared to the needs and interests of their local communities. The individual stations are autonomous, determine their own programming policy, and choose whatever programmes they wish from NPR production. About 50 hours of programming are produced each week in the NPR studios for the public network, including morning and evening news magazine programmes transmitted by satellite, radio drama, music and educational programmes.

NPR's Director of Educational Services, Mr. Brian Brightly, considers that public radio is a growing force in the United States, and has done much to revitalise radio as a communications medium. The

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public stations are now reaching a more representative demographic audience, with an estimated four million listeners weekly. Fewer than half the stations are currently involved in the provision of educational services to schools, colleges and universities.

At the post-secondary level, NPR's educational programming generally takes the form of a course for credit, with appropriate support materials, developed in conjunction with an academic institution. Some examples of this collaboration include "The World of F. Scott Fitzgerald" (produced in collaboration with Dallas County Community College District), "World Mythology" (with San Diego State University), and "Energy and the Way We Live" (with Coastline Community College, California). The courses, including audio tapes and support materials, are available for sale to other institutions through NPR which acts as a marketing agency.

A survey of 191 public radio stations conducted by the Corporation for Public Broadcasting (CPB) and published in 1980 showed that 53 stations provided post-secondary educational services, 15 provided both K-12 and post-secondary services, and 10 provided K-12 services only. Most post-secondary programming (56%) was categorised as informal education, but 34% consisted of formal series offered for credit, and in-service series accounted for 10%. Stations reported 8 762 enrolments at 54 colleges for the 57 formal post-secondary series broadcast, including 12 series which were audience-interactive.(4)

NPR has been described as "the creative flagship of American radio" and its innovative programming in current affairs, radio drama, etc., has helped to reshape the medium during the past decade. The increased commitment to educational programming following the Annenberg Foundation grant will undoubtedly facilitate the development of new approaches to the instructional uses of radio in the near future. No fewer than 87% of the stations participating in the CPB survey indicated that they intended to use more educational programming from national sources; they anticipated mostly main-channel distribution for these programmes, but also projected SCA and cassette tape distribution, especially for formal post-secondary series. NPR itself has foreseen the need to develop standard procedures for the

(4) Data extracted from "A Study of Public Radio Stations' Educational Services 1978-79", publ. by the Office of Educational Activities, Corporation for Public Broadcasting, October 1980.

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non-broadcast distribution of educational programme series to schools, colleges and libraries, and is setting up an in-house publishing service to handle cassette sales of NPR and member-station programmes. Thus there seems every prospect that educational radio in the United States has gained a new lease of life, and will retain an important if relatively minor role as an alternative delivery system in post-secondary education.

The Public Broadcasting Service (PBS) is the television equivalent of NPR, being the national membership organisation of independent public TV stations. It operates a satellite-connected system for programme distribution to 286 stations across the U.S.A., and also provides member stations with a broad range of support services, including programme development, audience research, publicity, fund-raising and underwriting. Funds are derived from station licensees and the Corporation for Public Broadcasting on a 50:50 basis.

Following restructuring in 1979, PBS is now organised in three separate national programme series:-

(a) PTV-1 - responsible for the presentation of prime time (i.e. 8-10 p.m.) general audience programmes drawn from many sources (including public TV stations, independent producers, foreign distributors e.g. BBC);

(b) PTV-2 - providing special interest programmes to specific audiences (e.g. minority and women's programmes, skills and self-improvement series, sports coverage etc.);

(c) PTV-3 - responsible for a range of educational programming, including
   (i) general audience, children's and youth programmes (e.g. 'Sesame Street');
   (ii) in-school instructional TV for kindergarten through secondary levels);
   (iii) adult learning and post-secondary programmes.

I spoke with Ms. Dee Brock, Director of Adult Learning Programming, in the Washington offices of PBS. She explained that, unlike NPR, PBS does not itself produce programmes, but instead works to develop

productions for national use by grouping individual station resources, designing and co-ordinating a national broadcasting schedule, and working with a wide range of producers in fostering programme development. Programmes are offered to public TV stations via the communications satellite system for regular over-the-air TV presentation. The multiple channel capability of the satellite system provides flexibility in programme scheduling and enables individual stations to choose programmes that best meet local needs and schedules.

In the past 10 years public television has become a significant force, with more than 2 out of 3 American TV households watching their local public TV stations each month (with the average home tuning in for 9½ hours during the month). In prime time, the average PBS-distributed programme is watched by about 1.5 million families, but major series have attracted up to 9 million families.

In 1980 there were 286 public TV stations operated by 156 licensees (including 54 Colleges and Universities). A CPB survey found that 89% of all licensees (139) provided post-secondary educational services, and of these 107 broadcast formal post-secondary series, 104 broadcast informal adult education series, and 54 broadcast in-service series. Total enrolments in formal series were estimated at 51 000 and in in-service series at 52 000. Forty-nine of the licensees made their post-secondary programming available in alternative formats, with videotape/videocassettes and cable television being the most common means of alternative distribution.(5)

The telecourse - an integrated learning system that employs both television and print materials - is the standard form of broadcast programming for college credit. The system is designed to provide the student with a complete educational unit employing a variety of learning strategies which he/she can study at home. The basic components are the television programmes, an accompanying text book, a study guide, and a book of readings; test banks, a faculty guide, a publicity kit, and other information for use by the offering institutions may also be included.

(5) Data extracted from "A Study of Public Television's Educational Services; 1978-79" publ. by the office of Educational Activities, Corporation for Public Broadcasting, February 1980.

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Telecourses may be developed specifically for television (examples are a 60 part series on 'American Government' developed by Dallas County Community College, and a 30 part series 'The Growing Years' developed by Coast Community College), or they may be developed from an existing television series (such as Kenneth Clark's 'Civilisation' or Jacob Bronowski's 'The Ascent of Man'). The latter are more likely to be broadcast in prime viewing time, whereas the former may often be broadcast in fringe times or even be relegated to non-broadcast distribution. In either case a particular institution (such as Coast Community College or Miami-Dade Community College) takes responsibility both for course development and for the development of accompanying print materials, which can then be offered for sale to other Colleges. In the case of such popular series as 'The Ascent of Man' and, more recently, Prof. Carl Sagan's 'Cosmos', the presenter of the TV programmes is also the author of a best selling book based on the series, which is then adopted as the principal text for the course.

At the Corporation for Public Broadcasting I spoke with Ms. Joan Katz, a Research Officer in the CPB Office of Educational Activities. As well as supplying me with copies of the two reports already referred to, she also made available an array of materials which together provide a comprehensive 'state of the art' review of telecourse use in the United States. These suggest inter alia that the way the course is offered (i.e. the amount and type of student support services provided by the offering institution) is of critical importance in determining student performance and completion rates.

The large community college systems with a commitment to telecourses as a means of reaching the non-traditional student stress the need for adequate support services - in particular, the provision of telephone or personal contact between student and instructor. Other student services contributing to successful completion of telecourses include: ease of registration; provision of detailed information regarding course requirements, etc., at the time of enrolment; faculty identification; inclusion of self-test materials in study guides; and availability of videotape copies of telecourse programmes in college learning resource centres.

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Several of the larger systems, notably Miami-Dade and Coastline Community College Districts, have found computer-managed instruction of particular value in providing student support services. Miami-Dade uses the RSVP or Response System with Variable Prescriptions, which is described as "a computer based instructional system unique to the Open College delivery system. Weekly or bi-weekly, the student responds to the appropriate set of questions by bubbling in a mark-sense card. The card is mailed to Open College where it is scored and is the basis of an individualised learning prescription indicating his performance to date and specific instructions or encouragement regarding his/her understanding. The letter is then returned to the student by mail".(6) Analysis of the system has found that participating students are more likely to complete the course and to have better grades.

The telecourse concept is now well-established, and with the advent of the Annenberg Foundation's 'University of the Air' appears to have a sound future. The development of alternative delivery systems such as cable TV and other non-broadcast technologies will increase the educator's ability to reach non-traditional students in non-traditional ways, and today's TV generation will have fewer inhibitions about using telecommunications as a medium for learning. However, economic factors, which have already led to the formation of college and university consortia for jointly developing and offering telecourses, will inevitably affect the rate of future development, both of conventional broadcast courses and of those employing such alternative technologies as cable, instructional television fixed services (ITFS) and videodiscs.

My final visit in Washington was to the National Association of Educational Broadcasters, where I met the President, Mr. James Fellows. NAEB is the professional association of people concerned with public and educational telecommunications, and fosters communication and interaction among professionals working in the field. Services provided to members include an extensive programme of training seminars and workshops; an annual conference; periodical and monograph publications; an employment referral service;

(6) quoted in "Telecourses: Images from a Changing Screen", by K.S. Munshi; report of a research project funded by the Corporation for Public Broadcasting (1980).

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and an executive education programme run in co-operation with the Harvard Graduate School of Business Administration. With its professed aim of promoting and maintaining a high standard of professionalism amongst public and educational broadcasters, NAEB provides a model which the fledgling Public Broadcasting Association of Australia could well emulate as the public sector becomes more firmly established in this country.

Following these discussions with senior staff of the national bodies, I was anxious to visit operational public radio and television stations before leaving the United States. The American Library Association was able to arrange a visit to the College of DuPage, a two-year community college located in Glen Ellyn, Illinois, on the western outskirts of Chicago, which operates an FM station WDCB. Unlike many such college operated stations, WDCB includes in its broadcast schedule several formal course offerings, in addition to the standard array of local programming in music, public and community affairs, children's shows, etc.

At the time of my visit four courses were being broadcast, with a total enrolment of about 140. They included NPR's 'World of F. Scott Fitzgerald', and three locally produced courses on 'Introduction to Business', 'Introduction to Data Processing' and 'General Psychology'. Two further courses are in production. Fees charged are the same as for on-campus courses (a standard per-credit charge of $14). Enrolled students receive a course packet containing the course outline, a study guide and other essential information (including the name and telephone number of the instructor in charge).

WDCB-FM, and programme development for the radio courses, fall under the jurisdiction of the Dean of Learning Resources, Mr. Richard Ducote. The station itself is located in the Learning Resources Centre, which also accommodates graphics production, photography, audio production, instructional television services, the library, and the administrative offices to support all these operations. Mr. Ducote explained the procedures followed in the creation of an

instructional radio course, following receipt and acceptance of a course proposal. The instructor submitting the proposal then meets with an instructional designer, and together they set the overall course objectives, establish the course outline, and set objectives for each individual unit to be broadcast (usually 20 x 30 minute programmes per quarter). These are then turned over for scripting to one of the writer/producer/directors, who develops the script in close consultation with the responsible instructor. When approved by all concerned, the scripted programmes are ready for production, using either the instructor (depending on his/her speaking ability and persuasiveness) or a professional narrator(s). The other production elements (such as music, sound effects, etc.) are obtained, and a production schedule is set. The total time required to produce a radio course at DuPage varies from 3 months to 18 months, depending on the demands of the course and the complexity of production.

The staff responsible for radio production believe that it is an under-rated instructional medium, and has failed in the past largely because of external factors such as poor on-air teachers, lack of financial backing and institutional commitment, and inadequate student support services. They argue that radio's virtues - its versatility, inventiveness, portability and practicality, not to mention its economy in comparison with television - make it a very effective educational tool when used creatively and with imagination. Nowadays, in their view, there are few subjects that cannot be taught by radio - even art or photography courses. Supporting print materials, visual aids, and study guides can be distributed to students, and the latter's visual imagination will do the rest.

The future of instructional radio may lie with alternative distribution systems rather than broadcast transmission. With the growth of cable TV in the United States and Canada, audio channels are often available and a dedicated two-way channel for radio instruction is quite feasible. Satellite communications may also provide additional opportunities for distribution, as can the sub-carrier system (side-band channel) to the main on-air channel of FM stations. As mentioned earlier, sub-channels on some stations are already being used for general and instructional programming for the visually handicapped.

With the assistance of the International Communication Agency in Washington, D.C., a visit was arranged to KCTS/9, the public television station serving the Pacific Northwest. Located on the campus of the University of Washington in Seattle, the station was founded in 1954 by a consortium of educators and community leaders, with the University holding the licence in trust for the community. It is the only public television station in North America formally established on the basis of partnership between a university and its community. It is also unique in that its formal ties extend across the Canadian border, for the Simon Fraser University in Vancouver, B.C., has recently affiliated with the station. The potential viewing audience now comprises two-thirds of the State of Washington and almost all of British Columbia.

Reflecting its strong educational links, KCTS/9 has an exceptionally high level of commitment to instructional television (ITV). Ms. Pat Woodley, the station's Director of Education, informed me that during the school year all weekday programming between 9 a.m. and 3 p.m. is scheduled for ITV, and that more than 35 school districts in Washington State and British Columbia are currently members of the station's ITV Co-operative. Locally produced programme series (by far the majority) carry one-year re-record rights for Co-operative members, and limited re-record rights have been negotiated for many of the remainder. The station also offers a number of telecourses at the post-secondary level for college credit, in conjunction with several Universities and Community Colleges within Washington State and with the Open Learning Institute of British Columbia. In the Fall quarter of 1980 these telecourses included 'The Body in Question', 'Connections', 'Cosmos' and 'Nova', all of which were broadcast at peak hours (8 p.m. or 9 p.m.), with repeats at noon. Several in-service credit courses were also broadcast.

KCTS/9 has an equally strong commitment to non-formal adult education programming. The series referred to above have all attracted large general audiences in their own right. The station is also a significant producer in this area, and at the time of my visit production had just been completed of 'Hard Choices', a six-part series of hour-long documentaries on ethical issues in sickness and health (e.g. sex selection at birth, human experimentation,

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death and dying). Funded entirely by the National Endowment for the Humanities, this series is accompanied by a well-produced magazine, and free discussion guides and a community outreach mechanism are being developed by the KCTS Education Department (with the aid of a grant from the Corporation for Public Broadcasting).

To ensure that its ITV programming meets perceived needs, the station has established a number of educational advisory committees, including a Superintendents' Television Committee, an Adult and Higher Education Advisory Committee, and a Curriculum Review and Advisory Committee. In addition there is a District Co-ordinators and Utilisation Committee with representatives of all participating School Districts, and an ITV utilisation specialist has been appointed to the station staff to facilitate further the effective use of ITV programmes in the schools.

I was able to watch some of KCTS/9's general programming during my stay in Seattle, and was impressed both by its quality and its variety. The mix of general educational programmes (such as 'The Body in Question' and 'Nova'), classical music, jazz, current affairs, and BBC imports (ranging from Vera Britain's 'Testament of Youth' to 'To the Manor Born') compared more than favourably with an average night's viewing on ABC Channel 2 in Adelaide. That the station has established a firm base of support in the community is evident from the fact that one third of its annual budget of more than US$4 million is raised by public contributions and membership subscriptions, with another 5% coming from corporate underwriting. (A further 8% is provided by the University of Washington and 6% from participating School Districts). I left Seattle with a much clearer perception of the contribution a broadly educational station committed to quality programming (and with a strong financial base) can make to the intellectual and cultural life of its community.

C. Libraries, Automation and Network Development

The United States has led the way in computerisation of library services and the development of resource-sharing networks, and I therefore wished to observe at first hand computer applications in a variety of libraries. I was also keen to examine aspects of library planning and design, and the administration and levels of provision of learning resources and services in college and university libraries. With the assistance of the International Communication Agency and the American Library Association I was able to visit the libraries of two major Universities (Chicago and Stanford), three Colleges (Du Page and Harper in Illinois and De Anza in California), two large Public Libraries (Chicago and Tacoma), the Washington State Library, and the Pacific Northwest Bibliographic Centre in Seattle.

(1) Library Automation and Networks

All libraries visited had computerised their systems to a greater or lesser degree. Not surprisingly the longest established applications were in the University of Chicago and Stanford University Libraries, both of which are numbered in the select group of large academic and research libraries which have attempted to develop and operate their own integrated systems, based on a locally maintained large-scale bibliographic data base in machine-readable form, and providing acquisitions, cataloguing and circulation control functions. With increasing costs, however, very few of even the largest libraries have been able to afford the expense involved in independent operation, and with the growth of co-operative networks the impetus for individual libraries to maintain their own integrated systems has largely disappeared. The University of Chicago Library is one of the few major libraries which still operates its own local system. In contrast Stanford University, largely because of the on-going costs associated with maintaining the necessary data base and systems, decided to make its BALLOTS system available to other libraries, and it now provides the bibliographic data base and services for the Research Libraries Information Network, a co-operative group including several of the nation's largest libraries.

Of more immediate relevance to automation developments in Australian libraries was my visit to the Washington State Library, which over the past decade or so has developed and implemented the Washington Library Network (WLN), with an emphasis on the provision of services to public and college libraries. WLN's particular significance lies in the fact that it has been designed as a state or multi-state system which can be replicated elsewhere, and as such it is currently forming the basis of trials being conducted by the National Library of Australia with a view to developing an Australian Bibliographic Network (ABN). The Barr Smith Library, the State Library of S.A. and the D.F.E. are currently participating in these trials.

At the Washington State Library I spoke with Mr. Gene Bismuti, Chief of the Information Services Division, who outlined the various computer applications which were already operational or were in the process of being implemented. At the time of my visit (December 1980) 59 libraries were on-line to the system and using the Bibliographic Sub-system; fifteen were also using the Acquisitions Sub-system. More than 80 library collections were represented in the data base of holdings locations. Although originally set up as an intra-state system, WLN in 1980 was serving seventeen out-of-state libraries, in Alaska, Idaho, Montana, Oregon and Arizona, and a further extension of such services is planned to support current patterns of library resource sharing.

The Bibliographic Sub-system allows general subject access to library materials, as well as location information. More than 120 on-line data bases in various specialised and technical fields are available through the system, thus making it possible to search and access rapidly the vast number of articles in periodicals, monographs, government documents, etc., by specific subject areas. The State Library's responsibility to serve as a major back-up resource for libraries throughout the State has been greatly enhanced by this on-line access, in particular through the rapid and comprehensive location of information and materials held by other libraries in the network. The powerful search capabilities

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of WLN have made it possible for the State Library and other participants to close their card catalogues with the knowledge that WLN provides faster and better access to bibliographic information. Towards the end of 1980 the bibliographic data base contained nearly 2 million titles and about 600 000 union holdings statements identifying one or more library locations.

The State Library's serials control system is also being linked to the WLN system. This will enable periodicals and serials to be checked in on-line into the WLN data base as they arrive, thus providing staff and patrons of the Library with immediate information as to which issues are available. Finally, it is planned to implement an automated circulation system as soon as possible. Mr. Bismuti explained that the Library has joined with two neighbouring libraries (one public and one college library) to form a Consortium for Automated Library Services with a view to implementing a co-ordinated on-line circulation system serving all three systems. It was hoped that this consortium could later be expanded to include other libraries of all types throughout the State. In the meantime the Tacoma Public Library has installed a pilot circulation sub-system (developed by Data Phase Systems) with a batch interface to WLN, and is planning to implement an on-line interface with the central computer system in the near future.

I was able to inspect and use the acquisitions and bibliographic sub-systems in operation at the Washington State Library, and the Data Phase circulation system at the Tacoma Public Library. All staff with whom I spoke were impressed with the effect which the introduction of WLN has had on library operations, and most (after some earlier hesitation) were now vocal in their support. I was told that the Acquisitions Sub-system, which had been introduced early in 1980, had already led to the elimination of previous backlogs, and had so increased productivity that 2.5 staff positions (of a total 7 or 8 in the section) had been saved in the section. In cataloguing, the WLN data base was able to provide about 90% of the bibliographic data required, with the remaining 10% of original cataloguing including non-print media and games, puzzles, etc.,

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purchased by the Library on behalf of various State institutions. Reference services have similarly improved, with key word access to the data base providing substantial savings in the time and energy expended in identifying and locating the information or materials requested.

At Tacoma the Public Library Director, Mr. Kevin Hegarty, told me that the Data Phase Circulation system had first been introduced in 1978, with the last Branch Library coming on-line shortly before my visit. The retrospective conversion of the bookstock of more than half a million volumes (260 000 titles) had been time-consuming but was now 80% complete. He considered that both WLN and Data Phase were sound and cost-effective systems, and he looked forward to the establishment of an on-line interface between the two. Unfortunately this was taking longer than expected, due largely to the increasing level of sales of the Data Phase system.

I left the State of Washington feeling confident that the National Library of Australia has chosen wisely in selecting WLN as the basis for an Australian Bibliographic Network. I consider that its relative flexibility and compatibility with other systems (such as Data Phase), together with new technological developments, will facilitate the establishment of an integrated national network structure. Needless to say, in these increasingly difficult financial times the speed and extent of this development will depend on the allocation of resources. I am convinced that organisations such as DFE can only benefit from participation in such a network, and firmly believe therefore that we should support the National Library's initiatives in this area to the fullest extent possible (when appropriate through representations to government). It is essential, too, that we should continue with our forward planning in this area, to ensure that our own internal systems are fully compatible with the emerging national structure, and should make a firm commitment of resources to support network development.

Since my return, the decision has been taken at State level to purchase the Data Phase circulation system for the Public Libraries Division of the Department of Local Government. As three local government authorities and DFE (through its involvement in the joint College/Community Library at Noarlunga) will also

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participate in the implementation of the system, a de facto consortium is emerging not unlike that proposed by the Washington State Library. It is not at all improbable in my view that this may eventually be expanded to include other types of libraries within the State, with the end result being the creation of a comprehensive regional network operating within an overall national framework.

(2) Resource Sharing in U.S. Libraries

The co-operative use of a large-scale bibliographic data base in machine-readable form as a means of sharing cataloguing costs has provided the rationale for most network development. Another major aspect of library co-operation which can be facilitated by networking is the sharing of resources, both through inter-library loan and co-operative acquisitions and storage programmes. As yet, however, resource sharing is not an integral component of most operational networks, and many of the present local and regional resource sharing programmes exist outside the network structure.

With the general reduction in library budgets in recent years, networks have placed greater emphasis on the inter-library loan (ILL) aspect of resource sharing. In mid-1979 the Ohio College Library Center (OCLC), with which most other networks are affiliated, made available its inter-library loan sub-system to participating libraries, thus enabling them to use its data base and telecommunications system to transmit ILL requests directly from one to another on a nation-wide basis. WLN provides detailed holdings information within its bibliographic sub-system (a key element of ILL), but does not have at present an operating message system to facilitate the loan of materials. An ILL sub-system providing a message switching and control function is planned and will be developed as funds become available.

WLN, which presently has the only operational network acquisitions programme, has shared collection development as one of its objectives. It remains to be seen how effective this intention will prove in actual practice, although WLN's organisational ties with the State Library should assist in developing a co-operative acquisitions programme amongst state-funded libraries.

A number of strong and successful resource sharing programmes exist at local, state and regional levels outside the network structure. One of the oldest and best-known co-operative agencies is the Pacific Northwest Bibliographic Centre (PNBC), which I was able to visit whilst in Seattle. Located in the Suzzallo Library of the University of Washington, PNBC celebrated its 40th anniversary in 1980. In 1970 it was incorporated as a non-profit corporation by the state library agencies of Alaska, Idaho, Montana, Oregon and Washington. Individual libraries in British Columbia and the provincial agencies of Alberta and Saskatchewan are also members.

PNBC maintains a union catalogue (on cards) with some 4 million entries representing the holdings of more than 50 libraries in the Pacific Northwest. It also has on-line access to the bibliographic and holdings information of the WLN data base. Its principal function is the location of books and other materials for member libraries and their users; if the requested titles are not located within the member libraries, PNBC staff search outside the region, contacting other libraries and networks. Inter-library loan requests are routed to the most suitable source, and alternative locations are given if the first library approached is unable to fill the request.

Although the number of requests received is beginning to fall, as more libraries use one or other of the networks to identify locations, PNBC still handles more than 80 000 ILL requests annually, with a success rate of 55%. It is recognised, however, that the growth of networking will involve a change in role for the Center, and at the time of my visit the PNBC was hosting a meeting of library representatives to discuss the development of a regional plan for future resource sharing.

I came across a very different type of co-operative resource sharing during my visit to Chicago. This was the Northern Illinois Learning Resources Co-operative, a joint project of eleven community colleges in the suburban area of Chicago. NILRC is operated through a board of directors representing the member

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institutions, each of which pays an annual fee of US$300, with additional funding being provided by the Illinois Board of Higher Education. The Co-operative's stated goals are:

. to reduce duplication of effort by sharing locally produced audio-visual materials;
. to co-operatively purchase commercially produced materials;
. to conduct in-service workshops for staff of member institutions;
. to share information on equipment, resources and procedures.

Recent and current NILRC activities include the development and demonstration of a comprehensive package of computer programmes which could be implemented in College LRC's; the development of mediated units or courses of instruction by staff from member institutions; a study of the potential of television as an instructional medium; a computerised union catalogue of A/V holdings; and workshops on such topics as copyright, non-traditional approaches to the teaching/learning of mathematics, and preview/selection of telecourses.

The growth of networking and resource sharing has been one of the most (if not the most) significant developments in American librarianship in recent years. As economic pressures have intensified, there has been a discernible shift in emphasis, from simple co-operation through inter-library loan, to a more basic concept of resource sharing involving inter alia the co-operative acquisition of materials and the joint provision of facilities and services. By and large Australian libraries have yet to face the challenge of integrating network activities (such as CLANN in New South Wales and CAVAL in Victoria) with a large-scale resource sharing programme. DFE, in its joint services with local government, has taken a first tentative step along the path which I believe other library systems and services will find it necessary to follow in the coming decade.

(3) Library Planning and Design

In view of my involvement with the planning and design of several CAE and TAFE College libraries in Australia, I looked forward with anticipation to inspecting some representative academic libraries in North America. In the United States these included two University

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Libraries (Chicago and Stanford) and three College Libraries (Du Page, Harper and De Anza). I was also able to visit a number of Canadian libraries (q.v. Chapter IV below).

(a) University Libraries

I was particularly impressed by the Joseph Regenstein Library at the University of Chicago, completed in 1970 at a total cost of US$20.75 million. As the cost suggests it is a very large building (almost 600 000 sq. ft. of floor space on seven floors), with a bookstock capacity in excess of 3.5 million and a seating capacity of 2 900. The architectural style can best be described as 'New Gothic', and the irregular shape of the building, which is further broken by projecting bays around the entire perimeter and by the use of deeply grooved limestone slabs for the exterior walls, helps to reduce the impression of great size and echoes the immediate environment of traditional, gothic-style university buildings. The irregular outline and deeply recessed entrances provide attractive views from within the library and repeat the quadrangles which are a feature of the campus, and will also facilitate future extension should this be required.

The interior design is highly responsive to the functional requirements of the library. Each service floor houses the resources and services relating to a major field or fields of study (e.g. Humanities, Social Sciences), and comprises four function-related elements - the bookstacks containing the monographs and periodicals in the relevant field(s); the reading areas with a variety of study seating (carrels, open tables and study rooms); between the stacks and reading areas is the service centre for the floor, including the circulation desk and staff, major reference works, specialised card catalogues for the collections housed on the floor, current unbound journal issues, and library subject specialists; and finally a group of faculty studies ranging in size from about 60 sq. ft. to 120 sq. ft. Thus for each group of related disciplines or fields a variety of study facilities is provided immediately adjacent to the corresponding bookstack area, and the intellectual apparatus for the effective use of those resources (abstracts, bibliographies, subject specialists, etc.) is also close at hand.

At Stanford University in California I visited both the Cecil H. Green Library and the adjacent J. Henry Meyer Undergraduate Library. The Cecil H. Green Library forms a new addition (or East Wing) to the main University Library, and was opened in January 1980. Together with the old West Wing, the total gross floor area is 375 000 sq. ft. on four levels. The estimated cost of the building is just under US$15 million.

An exterior feature is the use of exterior glass tinted bronze, with 49% minimum light transmittance, and framed in dark anodised aluminium. Internally carpeting has been used in most areas, with a mix of colours - rust, purple, blue or green in reading areas and offices, and red in stack areas. The shelving has been engineered to meet stringent seismic requirements, including heavy-gauge metal, additional support devices, and bolting to floors. Total bookstock capacity in the main Library (including both the old and new wings) is now 2.75 million volumes, with seats provided for 1 820 readers.

The J. Henry Meyer Undergraduate Library is linked at basement level with the main Library, but otherwise has a separate entrance. It is distinguished by a large central atrium which is aesthetically pleasing but in practice has proved detrimental to the effective functioning of the library. It wastes the time of both students and staff by forcing them to walk round it, acts as a conduit for noise, and (so I was told) facilitates the launching of paper darts and other missiles from the upper levels. A noteworthy feature is the Listening Center on the ground floor, with dial-access facilities for listening to records and tapes relayed from a central control point. Apart from listening units in the Center itself, students can use carrels distributed throughout the building to plug in earphones and listen to pre-scheduled programmes.

(b) College Libraries/Learning Resource Centres

Of the three Community (two-year) Colleges visited, two - the William Rainey Harper College in Palatine, Illinois, and De Anza College in Cupertino, California - possessed large and well-equipped Learning Resource Centres which had been custom-designed for the purpose. The LRC in the third, the College of Du Page in

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Illinois, occupied temporary premises (of some 30 000 sq. ft.!), and consequently was of limited interest in the planning and design context.

At William Rainey Harper College I was given a tour of the Learning Resources Centre by Mr. Ambrose Easterly, Director of Library Services, and Mr. Al Dunikoski, Director of Media Services (both of whom are responsible to the Dean of Educational Services, Dr. George Voegel). The LRC occupies two floors of a spacious three storey building with a total floor area of 105 000 sq. ft.; the third floor is being used as classroom space but will eventually revert to the LRC. It is well appointed and includes a variety of study spaces, equipped with individual carrels and reading tables. In addition to the usual range of library services the facilities include a printing service, graphics and photographic studios, a TV production studio (with colour cameras being installed at the time of my visit), an A/V maintenance and distribution centre, and listening and viewing stations.

The LRC provides a central TV distribution system via coaxial cable, with four college channels plus local broadcast channels. There is no dial-access provision, and apart from a few lecture theatres equipped with two-way video, all other locations on campus can only receive from the central distribution point. The cable distribution system was designed before the large-scale advent of video cassette recorders, which increasingly are being used as the preferred form of instructional TV presentation in the College.

The Learning Center at De Anza College in Cupertino, California, also provides a wide range of facilities and services, but unlike Harper does not incorporate a major production component. The name Learning Center is used advisedly, as emphasis is placed on its role in actively assisting students to become effective learners through provision of a variety of individual study programmes, and in helping faculty with the evaluation, selection and utilisation of media resources in their teaching (see following section).

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A former Dean of Instructional Services at the College, Mr. Gary Peterson, has been influential in promoting the concept of the LRC as a Learning Centre[7], and I was anxious to see to what extent his ideas were reflected in the LC building at De Anza. I discussed this aspect with the present Dean, Mr. George Sloan, and with Dr. David Glenday, Instructional Development Specialist, who conducted me round the building. Both considered the design to be functional, and felt that it contributed to the effective integration of the more traditional library services with an active programme of independent study.

Like other buildings on campus, the Learning Center is built in an attractive 'Spanish mission' style, and is centrally situated. It consists of two floors, with traditional library services concentrated mainly on the ground floor level. The main bookstacks are in the centre of this floor, with large reading rooms on either side; the latter are open to the roof, producing a feeling of light and spaciousness. A separate faculty reading room is provided. A/V services, technical processing, the administrative offices, and instructional services are grouped together at the rear.

The second or mezzanine floor contains a range of non-traditional learning areas and student services, including an Open Media Laboratory, Educational Diagnostic Clinic, Tutorial Center, Study Skills and Career Center, together with a large group TV viewing area and a small studio. (These services are described in the following section 'Learning Resources and Programmes in Community Colleges'). Access to the mezzanine is by three stairways and by an elevator reserved for use by the handicapped. On this floor, as throughout, staff and student furniture is predominantly in solid timber, contributing to a general impression of strength and warmth.

De Anza was built in the 1960's, when funds for education were still in plentiful supply. Given the added flexibility conferred by such relative affluence, it seemed to me that the architects of the Learning Center had nevertheless been particularly successful in combining an attractive, welcoming building with a functional service organisation. My only doubts related to the flexibility of the design to adjust to the effects of technological change in the coming decade.

(7) The educational philosophy is developed in his book "The Learning Center", publ. by Linnet Press, 1975.

(4) Learning Resources Centers in Community Colleges

My visits to the three Community (or two-year) Colleges in the United States gave me the opportunity to discuss with senior academic staff in the Learning Resources Centers several matters of particular interest, such as: the role and function of the LRC in the College; its administrative and staffing structure; budgetary allocations; and details of any special services provided to users.

All three Colleges cater for considerably larger student populations than are found in Colleges of Further Education in South Australia. Du Page has approx. 26 000 enrolled students (10 500 FTE), Harper some 25 000 (10 000 FTE), and De Anza 29 000 (15 000 FTE). Each provides a comprehensive curriculum incorporating both academic and technical programmes, along with a range of continuing education courses to meet the vocational, informational and leisure-interest needs of the local community, and developmental and remedial education programmes for school-leavers and adults lacking basic skills.

The Learning Resources Centers at Du Page and William Rainey Harper Colleges and the Learning Center at De Anza College all operate as integrated media collection and development/production centres. Each contains a book collection of 100 000 or more volumes together with an extensive range of non-print media. The LRC at Harper College, for example, contains some 200 000 catalogued items, of which approximately half are non-print. LRC staff establishments reflect both the size of the institution and the integrated nature of the services provided. Du Page LRC has 55 staff, including 18 engaged in media production; Harper has 44, half in Library Services and half in AV Media Services; and De Anza, with less of an emphasis on media production, has 40. In each case the professional staff includes both educational technologists and librarians, and the support staff includes technicians with training in library and media studies, TV production, graphics and photography.

(a) Role and Function

The stated function of each LRC is to support the instructional programme of the College by providing appropriate services to faculty and students. These include the acquisition and/or

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development, organisation and use of a range of print and non-print materials; involvement in the production of learning/teaching materials aimed at making instruction more effective; the operation of learning laboratories, closed circuit television, and equipment distribution services; and provision of a variety of independent study and self paced or self-directed learning programmes and services, together with learning assistance programmes for students with deficiencies in basic learning skills.

(b) Administrative and Staffing Structure

As is quite commonly the case in American two-year Colleges, the administrative head of the LRC in each of the three Colleges is a Dean. Titles and management patterns differ, and at Du Page the LRC is directed by a Dean of Learning Resources (Mr. Richard Ducote); at Harper by a Dean of Educational Services (Dr. George Voegel); and at De Anza by a Dean of Instructional Services (Mr. George Sloan). Of the three Deans only Mr. Ducote is a professionally trained librarian; Dr. Voegel and Mr. Sloan are educator/administrators whose field of expertise is instructional technology.

The LRC at Du Page is organised in four areas: Utilisation, Production, Technical Processes and Circulation, and Audio-visual Services, each headed by a Director. At Harper the LRC has two Directorates, (Library Services and Media Services), each comprising five sections; while at De Anza Instructional Services embraces Library Services, AV Services, Staff and Instructional Development, and Independent Studies.

A significant proportion of the LRC staff at each College has faculty status - 14 out of 55 at the College of Du Page, 12 out of 44 at William Rainey Harper College, and 9 out of 40 at De Anza College. This is undoubtedly a consequence of the LRC's active involvement in the instructional programme, and reflects a very different perception of its role compared to that prevailing in most TAFE Colleges in Australia. It is, of course, unrealistic to expect a marked change in that perception until such time as a sufficient number of qualified specialist and support staff can be appointed to our LRC's to develop and operate a similar range of services - as is now beginning to happen on a relatively small scale in some Victorian Colleges.

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(c) Budgetary Allocations

By present TAFE standards College budgetary allocations to their LRC's could reasonably be described as munificent. Du Page's 1980 allocation of US$1.6 million (including salaries) represented 8% of the College's total recurrent expenditure, and included $300 000 for new acquisitions (print and AV). Harper provided US$764 000 (including salaries) to the LRC, of which $397 000 was earmarked for Library Services and $367 000 for Media Services. De Anza's allocation totalled US$1.2 million, of which approx. 75% was committed to salaries. However, LRC staff at both Harper and De Anza Colleges were concerned that their allocations as a percentage of total College expenditure were falling, and believed this trend could worsen with increasing economic pressure on their Colleges. The staff at the College of Du Page were more optimistic, not least because construction of a new LRC building of 100 000 sq. ft., with accommodation for 1 000 readers and 300 000 volumes, was about to commence.

(d) LRC Services

An indication has already been given of the broad range of services provided by the Learning Resources Centers in the Colleges visited. Here I shall briefly describe some of the more innovative and non-traditional services and programmes offered to College staff and students and to members of the local community:

(i) Careers Information

The Planning Information Center for Students (PICS) at Du Page contains a multi-media collection of materials on career exploration, educational opportunities, specific occupations and job-hunting techniques. Information is arranged to help the user find the most appropriate resources to aid in planning future educational, career and employment goals. Employment search materials include samples for writing resumés and letters of application, as well as employment interview techniques. Also included in PICS is a Computerised Learning Aid System for Students (CLASS); by means of a CRT terminal and keyboard, users are able to explore computer programs on vocations and educational choices, and obtain detailed information on courses provided by specific Colleges.

The Career Center at De Anza College provides students and community members with counselling services, information and preparation for the process of choosing a career, finding a job, or changing one's lifestyle. Like PICS at Du Page, the Center includes a computerised career information system (known as Eureka). In addition, a series of courses covering the whole process of career/life planning is offered, which students can take in the form of classroom instruction or as an independent study.

(ii) Faculty Consultancy Services

At Du Page a materials utilisation consultant is assigned to each academic division to liaise with teaching staff and to improve communications between them and the LRC. The consultant's function is to promote the services and policies of the LRC, and to assist faculty members to make the most effective use of its resources, for teaching, professional development and research.

Similar consultancy services are also a feature of LRC Services at Harper and De Anza Colleges.

(iii) The Human Resources Exchange (Du Page) has been set up by the LRC as a clearinghouse or learning exchange; volunteers with particular expertise or skills in various subject areas are recruited to share their knowledge, talent, interest or hobby with others in the community. The LRC receives requests for information and where possible responds by matching the request with appropriate resource persons from its files.

(iv) The Learning Skills Laboratory (Harper) has been established to assist students entering the College with academic deficiencies. Programmes are designed around the needs of the individual student and courses are offered through individualised instruction. A "walk-in" tutoring center is available to which a student can come to receive tutorial assistance in most subjects offered by the College.

The Learning Center at De Anza College provides similar services, with a Skills Center to assist students to overcome deficiencies in basic skills through self-paced, self-instructional and

tutorial programmes; and a Tutorial Center which provides individual and group tutoring by specially trained De Anza and San Jose State University students.

(v) Co-ordinated Instructional Programmes at De Anza College provide packaged courses which enable students to work individually at an independent pace, either in the Learning Centre or at home via television or other media.

I was told that many of the larger Community Colleges (at least in the more affluent States) provide similar services to those just described. Often they are located in, and/or administered by, the LRC, or share the same administrative head. There are obvious practical advantages to be gained by co-locating student support services such as these with the associated educational and informational services provided in the LRC. I have no doubt that they are meeting a real and demonstrable need and are being used extensively. It is all the more regrettable, therefore, that due to funding constraints we have not had the opportunity to demonstrate a similar student-centred approach in the Learning Resource Centres at the Elizabeth and Gilles Plains Community Colleges, which were specifically designed to incorporate a comparable range of services.

D. Independent Study Programmes

Each of the Colleges visited made special provision for independent study. At Harper College, for example, students were able to enter into learning contracts with appropriate faculty members to pursue a course of study not typically available in a traditional course structure. The College of Du Page had established an Open College as a distinct unit in order to increase the variety and availability of learning opportunities. The alternative programmes provided to the community included individualised instruction, independent study, credit by demonstrated competence, credit through participation in radio and TV courses, and courses offered in factories, businesses and civic agencies in co-operation with the managements concerned.

However, it was De Anza College which provided the most extensive range of courses for credit presented in a variety of learning modes. Students could enrol for:

(i) Twelve Television courses, broadcast live on local television channels and also available for closed circuit viewing in the College Learning Center. These included Public Broadcasting Service series such as 'Ascent of Man' and 'Cosmos', several series on business and financial topics, and a number of College-produced courses;

(ii) Five Audio courses (one on Music and four German language conversation courses - the latter incidentally the same as those broadcast on 5UV) available in cassette form on payment of a deposit and rental fee. Again, students could listen to any lesson in the Learning Center if they wished;

(iii) Some twenty Mixed Media Courses utilising a variety of instructional formats and methods. In addition to reading books and periodicals, viewing films, videotapes or slides, and listening to audio cassettes, some mixed media courses also required visits to exhibitions, museums and institutions, but had no regularly scheduled class meetings. I noted that some of these courses were presented by staff of the Learning Center.

I came across a particularly interesting example of a self-paced independent alternative to conventional study in Chicago. Known as Study Unlimited, this programme is jointly sponsored by the Chicago Public Library and the City Colleges of Chicago. It offers a total of 33 audio-visual courses and 22 slide programmes that can be taken for college credit, College Credit by Examination Program (CLEP), General Educational Development (GED) instruction, or personal enrichment.

The college credit option provides community college-level tele-courses which enable students to review the course work, do homework, and take tests; upon passing, they receive credit which is applicable to an associate degree at the City Colleges of Chicago, and can also be used when transferring to a senior college or university. For the CLEP programme, Study Unlimited provides videotapes in different subject areas to help students prepare for the CLEP tests, which are used to grant credit by many colleges and universities.

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Study Unlimited materials are also used by students preparing for the General Educational Development test to receive the high school equivalency certificate. A GED-TV programme is broadcast on a local television channel, WTTW-TV, each week, and registrants receive workbooks to follow the series; students may register at any Branch of the Public Library system. The same series is also offered on videotape to students interested in completing the instruction at their own pace.

Library users can view all the video and slide programmes of Study Unlimited to increase their knowledge and understanding of a subject. At the Central Library they also have access to a PLATO terminal, which provides individualised instruction in topics ranging from easy maths to computer science. There is no charge for students using materials for personal enrichment, CLEP or GED instruction, but for college credit courses the cost is $17 per credit hour plus $3 for study guides.

Study Unlimited Centers are located at the Chicago Central Library on Michigan Avenue, and at a number of Branch Libraries. Each Center has a counsellor on hand to help students with any problems and to act as a liaison between the student and the instructor. The counsellors, provided by the City Colleges' Center for Open Learning, are available for 20 hours per week.

The Study Unlimited programme provides an impressive demonstration of the Public Library and City College systems working in close collaboration to fully utilise the educational potential of the former. As the Department's links with public libraries in South Australia grow closer as a result of the various joint use projects now being established, there should be increasing scope to develop similar co-operative programmes here. I hope that the combined College and Community Library in the Noarlunga Community College will provide a suitable laboratory in which to trial and evaluate a variety of self-paced learning programmes which are independent of the traditional classroom.

E. Educational Research and Development

In San Francisco my visit to the Far West Laboratory for Educational Research and Development proved to be one of the most interesting and informative of the entire tour. The Far West Laboratory (FWL) is one of seven regional educational research laboratories surviving from the era of President Johnson's Great Society programmes. It is an autonomous non-profit organisation established by public education agencies in the three states of California, Nevada and Utah. About two-fifths of its annual budget of US$8 million is provided by the U.S. Education Department's National Institute of Education, with the remainder coming from other offices within the Education Department, the state agencies responsible for its operation, private foundations and independent research contracts. About 40 projects are funded each year.

The stated objective of FWL is "to contribute to the improvement of the quality of learning experiences that support the values and functions of a humanistic society". To this end it is currently directing its efforts in four major areas:

(a) Research - conducting projects that can increase knowledge about the nature of education, or suggest solutions to specific problems or issues;

(b) Programme Development - leading to new, high quality products or processes that will serve the needs of learners (including particular groups such as the very young, the elderly, women, and minorities);

(c) Technical Assistance - conducting assistance programmes as required by funding agencies, and providing implementation assistance for new products or processes developed by the Laboratory;

(d) Communication and Dissemination - providing a forum for discussion and interaction among groups in education, and a clearing house for disseminating new knowledge on educational issues.

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One of the Laboratory's most successful innovations is Experienced-Based Career Education (EBCE), launched in 1972 as a pilot project with 30 students, and now adopted as a model by some 250 school districts around the country. EBCE takes high school students into actual work environments at the same time as they are meeting academic requirements; there is constant emphasis on relating classroom activities to the workplace. Using the information resources of the school's career center, students must complete 10 career 'profiles' each semester and at least one in-depth, work-oriented project per year. As a result students are brought into direct contact with practitioners in the professions, trades, business and industry, and other "community resource" personnel for several hours per week. As with our own Link courses, the underlying idea is to expose students to a career field rather than train them for any particular task, but many manage to get some 'hands-on' feel for the work itself.

In another, very different project, the Laboratory has developed (in conjunction with NASA) a satellite conference system linking together adult educators in western U.S.A. with colleagues in Hawaii, American Samoa, Guam and the Marianas. Through regular meetings held via PEACESAT (Pan Pacific Education and Communication Experiments by Satellite), the participants exchange ideas, provide advice to one another, and co-ordinate meetings. According to Mr. Paul Christensen, Principal Investigator, Adult Basic Education, who co-ordinates the project for FWL, the satellite link has helped to overcome difficulties sometimes experienced in face-to-face meetings due to the natural shyness of the Polynesian members of the group. "This way", he told me, "they get equal time".

In addition to Mr. Christensen I also had a most useful discussion with Dr. Sue McKibbin and Dr. Caroline Cates of the Education Dissemination Studies Program. Both are experienced researchers concerned with assessing and testing new approaches to educational policy, planning and organisation, and over the past 2-3 years they have assisted in the preparation of two important and significant monographs challenging many traditional assumptions

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in this area - "Alternative Perspectives for Viewing Educational Organisations" and "New Perspectives on Planning in Educational Organisations".* Together the two monographs provide a synthesis of recent organisational theory and research and the consequent implications for educators. Since much of the literature for educational administrators continues to be dominated by the more traditional approaches and prescriptions, the alternative perspectives which they offer are particularly timely and informative.

Although I was told the focus is shifting from the development of curriculum resources towards the dissemination of research into the teaching/learning process, FWL still maintains a substantial materials development and production programme. A wide variety of handbooks, manuals, literature reviews, research reports, training packages, slides, films, videotapes, audio cassettes and other materials has been produced under the Laboratory's auspices, covering such topics as teacher training, staff development, early childhood education, the teaching of reading, multi-cultural education, educational change, vocational education for women, etc. These are available for sale to institutions, teachers, administrators and the general public.

With its research, programme development and clearinghouse functions, and its status as a non-profit organisation set up under a Joint Powers Agreement, the Far West Laboratory has many similarities with the TAFE National Centre for Research and Development now being established in Adelaide. Because of its 15 years' field experience and a proven record of successful operation, it could well be taken as an appropriate model for the TAFE Centre. On the basis of my own discussions with FWL staff I believe that there would be considerable interest in establishing an informal reciprocal relationship between the two bodies, embracing, for example, the exchange of information, programme materials, and in due course, perhaps, the exchange of staff. I have no doubt that such links would prove of great benefit to the Centre, and by extension to our Department.

* copies of the two monographs have been forwarded to me since my return and are available for consultation.

IV CANADA

My visit to Canada began on Saturday 22 November in Toronto, and concluded in Vancouver, B.C., on Sunday 7 December. During my stay in these two cities I visited the following agencies and institutions:

Toronto, Ontario

Ontario Educational Communications Authority
Ontario Institute for Studies in Education
Ryerson Polytechnic Institute
University of Guelph

Vancouver, B.C.

Vancouver Community College
Capilano Community College
Management Advisory Council, B.C.
Open Learning Institute
British Columbia Institute of Technology
University of British Columbia

A. General Impressions

This was my first visit to Canada and I looked forward to it with considerable anticipation. My only disappointment was the curtailment of my stay to 15 days. The environment was at once congenial and familiar (doubtless due to the historical links Australia and Canada both share with the U.K.); the two cities exuded a restrained prosperity, and despite a high unemployment rate (close to 10%) there was little or no sign of the decaying inner suburbs so evident in Chicago; public transport was clean and dependable (in stark contrast to London); and I was welcomed with a degree of warmth which not even the first snowstorms of the Canadian winter were able to cool.

Although the accent in hotels, shops and streets was recognisably North American, the spelling was not - programme, centre and catalogue proclaimed their transatlantic origin, as did the Queen's profile on the coins. The press was full of debate concerning the 'repatriation' of the constitution - due to an historical anomaly

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the British Parliament retains the power to approve or reject constitutional amendments - and (shades of Australia) the threatened secession of the western provinces on the grounds of federal interference with the provincial governments' rights to exploit natural resources.

To a far greater extent than Australia, Canada is already a wired society. Not only do 96% of all homes have television and telephones, but cable television is now available to some 70% of all households. The predominance of American-originated programmes on cable has prompted much controversy on 'cultural imperialism' and the need to maintain a specific Canadian identity in the mass media. At the same time there is a growing concern at the potential social impact of the new communications technologies, which threaten the survival of some existing media and institutions in their present form. I was referred to a fascinating book published last year, (whose authors include the Assistant Deputy Minister (Research) for the Canadian Department of Communications; a former Director-General, Technology and Systems Research and Development for the same Department; and a former President of the Canadian Broadcasting Corporation) which predicts:-

> "Fortunes will be lost; fortunes will be made. Many an old institution will go under; many a new one will spring up. Authors will drift back into anonymity; librarians will gain vast new powers and respect; teachers will understand at last what drove the Luddites and some of them will teach themselves how to destroy cable-lines. We will all learn to be TV producers just as we once all learned how to write. Pollsters will do serious battle with parliamentarians and the staunch, free-enterprise newspaper owners who fail to adapt or merge will suddenly learn, as their profits disappear, why artists, musicians and book publishers love and loathe the Canada Council. The great corporate battles and mergers of the decade will be among telephone companies, cable companies, publishers, data processors and advertising agencies." (8)

Australia has yet to face up to the social implications of the communications revolution, despite the fact that automation has already made significant inroads in some industries, videotext services are being introduced this year, the first domestic satellite will be launched by 1985, and a government enquiry into the introduction

(8) GODFREY, D. and PARKHILL, D., eds. "Gutenberg Two: The New Electronics and Social Change". 2nd edn. Toronto and Victoria, Press Porcepic, 1980.

of cable television is now under way. In Canada (which is several years further advanced along the path of technological change) we have a unique opportunity to observe the effects of these and related technologies on a broadly similar society, and to learn from the educational strategies being developed to meet changing community needs.

B. Educational Communications and Technology

(1) The Ontario Educational Communications Authority

My first visit in Toronto was to the Ontario Educational Communications Authority, the largest educational communications organisation in Canada and a world leader in the field. Through contacts made with two OECA staff members in Canberra during a joint Canadian-Australian demonstration of satellite communications in 1979, I had arranged to spend two days studying its administration, planning procedures, television production and programming, experiments with the educational use of satellites, and latest developments with the Canadian version of teletext, Telidon. I was able to discuss these aspects with a number of senior staff, including Dr. L. Miller (General Secretary); Mr. D. Tilroe (Design Officer, Learning Systems at Home); Mr. Don Robertson (Superintendent, Utilisation Services); Dr. Maria Cioni (Telidon Project); Ms. O. Kuplowska (Project Research Officer); Dr. Ignacy Waniewicz (Director, Development Research); and Mr. L. Gerner (Director, Market Research).

The OECA is an Ontario crown corporation, producing and distributing educational programmes and materials to meet the full spectrum of learning needs, from pre-school to retirement, and undertaking research in the educational broadcasting and communications fields. Approximately 85% of its base budget of some $23 million Canadian is currently received from various government departments (i.e. not by direct grant). The 15% now coming from non-government sources is expected to increase to 30% of the budget by 1985, and greater attention is therefore being paid to marketing. The activities which were of particular interest to me were: the educational programming of TV Ontario, OECA's television network; the field trials utilising Telidon as an educational medium; and new developments in programme evaluation research.

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(a) TV Ontario, the network operated by OECA, consists of nine TV stations (with three more under construction), which can reach about 85% of Ontario's 8 million people. It broadcasts from 13-17 hours per day, and some 2 million viewers watch at least once per week. Its programmes are also transmitted via many cable channels and are available on videotape to all educational institutions, libraries and other community organisations for a nominal fee. Approximately 1 000 new programmes are screened each year, of which about 60% are acquired from external agencies, such as the BBC and the Public Broadcasting Service.

OECA's programming is not simply confined to supporting the teaching programmes of schools, colleges and universities. Through TV Ontario it also provides a channel for informal learning through which the general public can broaden their intellectual and cultural interests, and can acquire knowledge and skills in subject areas and in teaching situations which are not usually available through formal educational institutions.

Mr. D. Tilroe, Design Officer for Learning Systems at Home, explained to me how 'open sector' programming is used to develop opportunities and resources for informal learning in the home. Support materials such as booklets, audio tapes and learning kits are developed as learning resources to accompany and expand the content of a variety of general TV programmes - for example, 'Saturday Night at the Movies'. I was surprised (and not a bit chagrined!) to find that the Australian series 'The Sullivans' is being used in this way. TV Ontario produces a magazine-type publication to accompany the series which incorporates contemporary press materials showing the social and political conditions of the time in Canada, which is available either to individual viewers or to adult education agencies for use in discussion and tutorial groups. This particular example provided a pointed contrast to the general failure by such agencies in Australia to exploit the manifold opportunities for learning provided by the home TV set.

During 1980 TV Ontario introduced a new concept in adult learning, the TV Ontario Academy. This was described to me by Dr. Ignacy Waniewicz, Director of Development Research, as an attempt to reach and maintain continuous contact with larger numbers of learners on a

personal basis throughout the duration of a television-based learning project. It consists of a combination of high quality TV programmes covering a well-defined body of knowledge, a computer-managed learning system, and custom-designed course materials. Viewers are free to define their own goals according to individual needs and interest - they can either simply watch the programmes, or obtain a copy of the support material, or enrol with TVO as a course participant.

At the time of my visit two Academies had been presented and a third was due to go to air in January 1981. The first two, on 'Health and Environment' and 'The Music of Man', together attracted more than 700 students as paying participants, while 5 000 letters of enquiry had been received for the third, a 'Parents' Academy'. (I heard subsequently that about 2 000 participants enrolled in the latter.) Each of the Academies has been built around existing TV programmes (i.e. they were not produced specifically for teaching purposes). Subject specialists are engaged on contract to develop curriculum materials around the programmes, and to expand on specific aspects as required. The project team for each Academy consists of a co-ordinator (Dr. Waniewicz), a project officer cum educational designer, a computer programmer and the appropriate subject specialists.

The major components of a TVO Academy, in addition to the television programmes, are:

- a learner's guide, containing the educational objectives of each learning unit or programme, the date and time of the broadcasts and their repeats, and advice on other related activities such as field trips, exercises, etc. It also lists public libraries and other institutions which hold relevant reading materials and where videotapes of the series are available for viewing;

- background essays of between 2 and 15 pages to accompany each programme, together with lists of recommended readings for participants who wish to study the topic in greater depth;

- multiple-choice questions which are developed for each unit, and are intended not so much to evaluate the learner's progress as to stimulate the participants' curiosity and sustain their interest;

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- the computer managed learning (CML) system which enables individualised letters to be sent to participants in response to their answers to the multiple-choice questions. The system, which has been developed by Miami-Dade Community College, enables each participant to receive comments and suggestions which take into account not only his or her choice of answers but also the personal learning goals and interests, educational background, occupation, etc. as stated on the registration form. At present the computer programme runs on an IBM 360 or 370 computer, but a micro-computer based version is now being developed;

- newsletters are sent to all participants in each Academy, providing an important means of sharing experience and exchanging observations.

Evaluation of the first two Academies has confirmed the viability of this mode of learning, with 90% of respondents finding the main components (the TV programmes, learner's guide, the sets of questions and computer generated responses) to be 'very useful' or 'somewhat useful'. The response to the 'Parents Academy' provides further evidence of the system's potential as a learning process. Dr. Waniewicz considers that the Academies are a significant achievement in two respects - firstly, they have demonstrated the educational and instructional capabilities of broadcast television; and secondly, they have shown that interactive television can be effective without the interaction necessarily being immediate. In addition, they have provided valuable experience in the development of new types of course materials suited to the educational design of a telecourse.

Plans for future Academies include a series on computing (designed principally for teachers but which is also expected to attract many participants from the general public), and others on such diverse subjects as moral choices in contemporary society, problems and issues in the modern Middle East, and technology for non-technologists. While I can see little immediate prospect of DFE being able to develop or present comparable telecourses, nevertheless it would, I believe, be most valuable for the Department to purchase some representative Canadian and US courses for detailed study and evaluation.

(b) Telidon and Education

Given the OECA's mandate to develop educational communications, its extensive distribution system, and its production capacity, it has naturally taken a keen interest in the potential applications of videotex in education. Since August 1978, when the Canadian Department of Communications unveiled Telidon, its alpha-geometric videotex system featuring high resolution graphics, OECA has taken the lead in developing educational applications for the new technology. It is believed to be the only educational agency that is attempting to develop both interactive and broadcast (teletext) modes in an integrated approach.

The basic Telidon system consists of a keypad, a TV display unit, a decoder and display generator, a telecommunications link, and a central computer containing the data base. The keypad is the viewer's means of access to the data base, while the decoder converts the TV set into a videotex display unit. In addition to text, Telidon can provide images of almost photographic quality, graphic animation, and overlays. The system can operate over telephone lines, cable TV, optical fibres, broadcast, satellite, microwave and packet-switching networks, and is considered by OECA staff to be adaptable to any foreseeable change in communications and computer technologies.

The Telidon field trial being conducted by the Authority is a composite experiment using both broadcast and interactive modes of delivery. The initial aim is to demonstrate the system's potential for education/information providers and promote the creation of educational content. A total of 55 Telidon terminals operating in both modes have been placed in schools, colleges, universities, libraries, museums, and private homes.

The broadcast trial by TV Ontario began early in 1980 and by mid-year several hundred "pages" of information were available, with about 20% devoted to OECA purposes. The remaining pages carry information provided by other educational institutions concerning course offerings and registrations, correspondence, etc., and general news, weather, and financial reports. TV Ontario intends at a later date to utilise

Telidon to offer such general services as multi-lingual subtitles and captioning for the hearing-impaired to accompany the network's regular TV programmes.

In the on-line interactive trial, participants have telephone access to a 10 000 page computer data base in Toronto. (It was this data base which was available for the 1979 Canberra demonstration using the Hermes satellite). The educational content is being provided by participating schools, post-secondary institutions and libraries. At the time of my visit trials were under way or about to commence in Toronto, Ontario; Winnipeg, Manitoba; St. John, New Brunswick; and Montreal, Quebec. OECA also proposes to take part in a Canadian Cablesystems trial of Telidon. Cable TV, with a penetration of some 70% of urban households, provides a viable alternative for the distribution of both broadcast and interactive Telidon.

As a result of my talks with Dr. Maria Cioni, Liaison Manager for the Telidon project, and other staff members, I was left in no doubt that OECA considers Telidon to be a significant educational medium in its own right. It has the potential to deliver educational programmes to anyone, regardless of location or time; its interactive capability allows each learner to proceed at his/her own pace with periodic feedback on progress; its exceptional graphics capability can provide a wide range of educational illustrations (e.g. music scores, charts, graphs, symbols, maps, etc.); and it has the ability to provide pages of information that unfold at a controlled rate, thereby focussing the viewer's attention and pacing the learning experience.

The potential applications of Telidon for education include the following:

- as a complement to educational television (e.g. broadcast listings and reviews; programme notes and teachers' guides; captioning; advertising of seminars, workshops, etc.);

- as an alternative to conventional print processes (OECA currently spends $500 000 p.a. on printed materials; Telidon makes possible the electronic publication of catalogues, bibliographies, and prospectuses);

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- for dissemination of educational information (e.g. administrative and curriculum information, job opportunities, etc.);
- for information retrieval (e.g. educational research, bibliographic information);
- for interactive learning programmes (including computer-assisted and computer-managed learning, correspondence courses, educational games, etc.).

The objective of the field trials is to get an initial user response to the technology, the software, and the applications. With 55 terminals being moved through a variety of settings (including homes) throughout Ontario it is hoped to get a broad cross-section response to the use of Telidon in education.

I personally found the achievements to date and the work in progress stimulating and exciting. If and when Telidon is able to gain a secure foothold in a very competitive world market, it has the undoubted potential to revolutionise educational delivery systems, especially in distance education.

The proviso is important, however. Concern was expressed by some OECA staff that Telidon development overall appeared to be lagging, particularly in comparison with the British Prestel and French Antiope systems, and its future will depend on its ability to gain a share of the non-Canadian market (not least in the U.S.A.). It was therefore interesting to find on my return to Australia that the Myer group is lobbying to introduce Telidon as a commercial videotex alternative to the Telecom-sponsored Prestel in this country.

(c) Media Evaluation

The OECA has also been closely involved with the development of PEAC (Program Evaluation Analysis Computer), an innovative new approach to the evaluation of media presentations. Developed by a private research organisation, PEAC is a portable micro computer-based system designed for group testing of television, video, radio or film materials at any stage in the production process. It is capable of providing a minute-by-minute analysis of audience reactions to programme content almost

instantaneously. Educational institutions can use the system to assess the effectiveness of their broadcast or distance teaching materials, and modify them to meet the learning needs of specific student groups.

The PEAC system contains three basic elements:
. a response unit for data input;
. a computer for data analysis; and
. an output device for displaying the results.
The response units are small, calculator-like keypads incorporating a micro-processor which are used to record and store viewer/listener responses (which may be obtained continually throughout the programme, at ½ second intervals if required). After the data has been collected and stored in the response units, it can then be easily transferred into a 48K Apple II micro-computer for immediate analysis. Results can be displayed on a TV monitor in the form of statistical tables, colour charts, or high and low resolution colour graphics; alternatively, hard-copy data can be supplied by a teletype printer from the Apple II output.

PEAC offers several advantages over traditional evaluation and audience monitoring techniques. Time and cost savings are estimated to be as high as 80%; minute-by-minute monitoring of audience reaction can be synchronised with videotape playback; its complete portability enables testing to take place in virtually any location; the use of alpha-numeric response units facilitates simultaneous testing in several languages, while a variety of evaluation designs are programmable on the units. The system is now used by several major production agencies in North America (including the Children's Television Workshop, producers of 'Sesame Street'), and PEAC systems are also being installed in Japan and Europe.

In the opinion of OECA staff PEAC has significantly improved the productivity of the Authority's formative research and programme evaluation, providing a range of information not readily available through other forms of testing. While each evaluation can be designed to meet the client's specific needs, the testing and reporting procedures are standardised to facilitate comparisons between different studies.

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To date, very little formal evaluation of media materials (including those produced by Educational Multi-Media) has been attempted within DPE, largely because of the costly, time-consuming and complicated testing procedures involved. PEAC has replaced these with a fast, reliable and easy-to-use research tool for assessing the impact of all forms of presentation on specific target audiences; its complete portability means that respondents can evaluate materials in the studio, in classrooms, or in their own homes. In a brief demonstration it appeared to me to be ideally suited for use by the Department to determine the educational effectiveness of different formats in a variety of learning/teaching situations, and to design media programmes tailored to the interests and levels of understanding of specific student groups. The system is available for purchase, and I am confident that the cost would soon be recouped in terms of the more effective use of educational media in departmental programmes.

(2) The Knowledge Network of the West, British Columbia

While at OECA I was informed that a new educational communications authority, the Knowledge Network of the West (KNOW), was being established in British Columbia by the provincial government. Although I was unable to visit the offices of the new agency in Victoria, on Vancouver Island, I was given detailed information about its establishment, operations and programmes by Mr. Robert Harris, Executive Director of the Management Advisory Council, Department of Education, Vancouver, and Mr. Derek Knox, KNOW liaison officer at the British Columbia Institute of Technology.

KNOW was set up in May 1980 "to assist, and collaborate with, universities, colleges, provincial institutes, school districts, ministries and agencies of the Province in the development and delivery of educational programmes and materials", and "to establish, maintain and operate a telecommunication network". As it is not itself an educational agency, but a telecommunications network, responsibility for course and programme development and delivery is vested in participating educational institutions.

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The Knowledge Network is developing three inter-related services:

(a) Universities' communication system connecting the Universities, the B.C. Institute of Technology, teaching hospitals, law courts and other institutions by a closed-circuit cable and microwave system for teaching, medical diagnosis and other specialised purposes;

(b) Inter-institutional instructional delivery system using satellite, cable and ITFS systems to distribute courses and programmes developed by the Vancouver and Victoria institutions to schools, colleges, libraries, etc., throughout the province;

(c) Educational television channel using satellite, cable and microwave to access reserved community cable channels for the delivery of educational TV programmes directly to homes in many parts of the province, including the metropolitan areas.

A Program Advisory Committee has been appointed by the Network Board to assist in establishing criteria and setting priorities for courses nd general educational programmes to be carried on the instructional network and the educational cable channels. It is proposed to include:

. Telecourses - courses for credit in a post-secondary institution in which television is an essential component of the course;

. Video support for post-secondary courses - TV programmes designed to augment a distance education or conventional institution-based course;

. Interactive instruction - courses delivered 'live' over the network and requiring students to interact by telephone from selected locations. (At the time of my visit several such courses had been provided via satellite from the BCIT studios);

. General education - quality TV series (e.g. from the BBC and PBS) which, when augmented by print materials, will provide the focus for 'living room learning' experiences for viewers throughout the province;

. Schools' and children's programming from the Provincial Education Media Centre;

. Local educational telecasts from Community Colleges and school districts.

Some 35 hours of weekly programming transmitted via the Anik-B satellite began on a trial basis in September 1980, and a full schedule of educational programming (70 or more hours per week) commenced the following January. As KNOW extends its links with cable TV systems, communities throughout British Columbia and parts of Alberta and the Yukon will have available a broad range of informational and instructional programmes, supporting and enriching existing courses and providing new learning opportunities to many people in their own homes.

Unlike Ontario, British Columbia is not a particularly rich or populous province. It has, nevertheless, seized the opportunity presented by the new communication technologies to extend post-secondary educational programmes to people living in widely scattered and often remote areas of western Canada. Its experience in utilising communications satellites for education - and particularly for the delivery of interactive instructional television - should enable post-secondary authorities in Australia to assess the potential effectiveness of this mode of delivery as a means of meeting the education and training needs of rural and remote communities well in advance of the launch of our first domestic satellite. Results of the initial trials strongly suggest that this form of distance education is both feasible and effective, and is well received by the people it is designed to serve.

(3) Educational Broadcasting - Open College, Toronto

I was able to visit only one educational radio station in Canada - CJRT-FM, located on the campus of Ryerson Polytechnical Institute in Toronto. Originally owned by Ryerson, the station is now operated as a non-profit corporation, with an annual budget of $1.23 million Canadian for 1980/81. It has 28 full-time staff (including 9 working in its educational department, the Open College), plus freelance and contract staff. Its 19 hours of daily broadcasting include classical music, jazz, folk, news, public affairs and educational programmes; the latter include both university-level credit courses and non-credit general interest courses.

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Open College is a unique partnership between the station and the Institute's Continuing Education Division. It has been offering courses by radio for the past 10 years, with the aim of providing a point of re-entry into the post-secondary educational system. Courses selected are those most likely to have transferability at other colleges and universities. Degree and certificate level courses offered in the 1980/81 academic year included Psychology in the Workplace; Ethnic Relations in Canada; City Politics; Social Ethics; and Gerontology I and II.

Students can listen to the one-hour radio programmes at home or at work. They are broadcast in the afternoon and are repeated in the evening and on Sunday, giving three chances to hear each programme. Several courses are also available on cassettes. A course normally contains 48 programmes, broadcast at the rate of two per week. In addition to the radio programmes, a student work-book is prepared, containing learning objectives for each programme, outlines of the material to be presented, required reading, any necessary diagrams and charts, details of assignments, etc.

Students enrolling for a credit course are assigned a tutor who marks assignments and examinations, and is available for phone consultation. During each course two weekend study sessions are held at Ryerson, giving students the opportunity to attend lectures and workshops, meet their fellow students, and talk over any problems with their tutors (each of whom has responsibility for 25 students).

The production team for a new course usually consists of one or two instructors, an editor, and a producer. If the instructors have no previous media experience, they are given training in basic broadcasting skills (such as techniques of interviewing, writing for the ear, and speaking a script rather than reading it). Open College has opted to train the instructor rather than hire professional writers and presenters, as this is felt to be a more personal approach to students.

Enrolments vary from course to course. I was told that 150 students enrolled for Gerontology I in 1980/81, of whom about 20% dropped out during the year; there were 40 enrolments for City Politics, and

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225 registered listeners (people who wish to receive the course material but not to take it for credit). Although few Open College courses attract more than 200 students, the Bureau of Broadcast Measurement estimates that the overall listening audience ranges from ten to twenty thousand - an indication of the value of educational radio to the wider community.

Open College also presents informal non-credit courses, all of which have outlines available for a nominal charge. These have included several courses on music history and the history of opera, a course on the Middle East, and an introduction to the Canadian political system, all presented by faculty members of the University of Toronto. It has also run an informal public affairs series in co-operation with the Toronto Community Law Program, covering such topics as marriage and divorce, wills, purchase and sale of houses, landlord and tenant relations, and personal income tax. Each programme is followed by a broadcast phone-in, with lawyers in the studio answering questions from listeners; the public response to these programmes has been particularly impressive.

CJRT-FM has demonstrated the ability of non-commercial educational radio to attract and retain a committed listening audience in a metropolitan environment seemingly saturated by television (both broadcast and cable). In 1979/80 the subscriptions and donations received from corporate supporters and some 8 000 individual listeners provided one third of its total budget (most of the remainder coming in the form of grants from provincial government departments). The proven success of Open College/Ryerson courses has shown that radio can be used effectively for certificate and degree-level instruction, and appeals to many potential students as a means of re-entry to formal education.

A number of our own Open College of Further Education certificate courses would be well suited to this mode of delivery, and I believe it would be worthwhile to select one or two for radio presentation on a trial basis. There is no doubt that in the Centre for Open Studies and the Centre for Resource Development we have the academic and technical expertise needed to develop a radio-based course of a

suitably high standard. Evaluation of each component of the course by both students and staff would need to be carried out to assess its value as a medium for learning.

C. Academic Libraries and Learning Resource Centres

Libraries visited in Canada included two University Libraries (Guelph and British Columbia), two technological institutes (Ryerson and British Columbia), and two Community Colleges (Vancouver and Capilano). As in the United States, I wished to pay particular attention to computer applications, library planning and design, administrative structures and levels of resource provision in college and university libraries.

1. Library Automation

The six libraries visited were all making use of computerised systems. The McLaughlin Library at the University of Guelph was one of the first academic libraries in North America to adopt automation on a large scale, and one of the design criteria for its new building (opened in 1968) was that it should accommodate automated systems. Separate computerised systems for the cataloguing and processing of government publications, monographs and serials were designed and implemented by Guelph staff as early as 1967. An automated batch-mode circulation system was introduced the following year as a subset of the cataloguing system, extracting the relevant data elements from the bibliographic master file.

The off-line batch mode system although successful at first, proved inadequate to cope with rapid increases in enrolments, collection size, and library use, and in 1976 the decision was made to switch to on-line circulation. The system now in operation is based on a GEAC 8 000 mini-computer and incorporates a 256k CPU, two 300 megabyte disc drives, a 125 line per second magnetic tape drive, a 300 line per minute printer and up to 32 communications ports. Of the 26 terminals currently in use, six are available for public enquiry, ten are manned to give public service (e.g. circulation charge and discharge), and ten are dedicated to technical services (e.g. updating of files). Each terminal offers a selection of functions which can be performed, and which are displayed on the CRT in a 'menu'.

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I was interested to observe use of the system for public enquiry. The enquiry module has been designed with self-instructing display screens which lead sequentially from one command, instruction or question to another. The user selects the appropriate key from the 'menu', and after locating the wanted title he/she can move to another set of functions which allows him/her to determine the location, status and loan period for the item, and to place a hold on it if it is on loan. Users may also inquire about their own borrowing records - i.e. which titles they have on loan, when they are due for return, amount of fines owing, etc. The direct availability of this information to the user has led to substantial savings in the amount of staff time previously taken up with such routine enquiries.

Mrs. Margaret Beckman, the University Librarian, believes that the ideal automated library system is a distributed one; most university libraries in Ontario now have stand-alone systems which are compatible with each other and can be linked to allow the exchange of bibliographic data, inter-library loan transactions, and so on. She considers that the micro-computer systems now coming on the market at moderate cost (e.g. $20 000 for hardware and $20 000 for software) will provide significant savings for smaller libraries and will obviate the need to set up expensive centralised bureaucracies. These systems would appear to be well suited for a network of small to medium-sized libraries such as is developing within the Department and in the public library sector in South Australia.

The Library of the Ryerson Polytechnical Institute in Toronto also relies on computer systems in acquisitions, cataloguing and circulation. The Library is a member of the College Bibliocentre, a co-operative agency heavily subsidised by the provincial government. All technical services are handled by the Centre, and new books are delivered to the Library fully processed. The Institute pays an annual membership fee of Can. $35 000, plus $1 per volume for ordering and $1 for cataloguing. Mr. John North, Director of the LRC, (of which the Library is a part), estimates that membership of the Centre has saved three full-time positions in technical services.

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The Library has replaced its card catalogue with COM catalogues, 80 sets of which (updated) are produced each month; multiple copies are provided on each floor of the Library, and sets are also sent to the teaching departments. In September 1979 the Library installed the DOBIS/LIBIS on-line circulation system, and Mr. North informed me that it has performed exceptionally well to date, with the IBM computer remaining operational for some 99% of the time.

In British Columbia developments in library automation have taken place in a framework of close co-operation between the various post-secondary institutions (i.e. the Universities, the Institute of Technology, and the Community Colleges). With the active support of the Ministry of Education, and the efforts of individual libraries (in particular, that of the University of British Columbia), a high degree of bibliographic control has already been achieved, including:

- standardisation and automation of cataloguing procedures in all post-secondary libraries;
- substitution of computer-produced microfiche catalogues for the earlier, labour-intensive card catalogues;
- sharing of catalogue records on-line, and establishment of a union catalogue of library holdings to facilitate inter-library lending and rationalisation of collections;
- retrospective conversion of the bibliographic records of all college libraries, and part conversion of those of the universities, to machine-readable form.

The long-term objective is to create a unified, comprehensive data base incorporating the bibliographic records of all libraries in the province, and to make this data base accessible on line to all libraries (including public libraries). It is proposed that the next step in the process should be to establish a computer-based bibliographic control facility in the province, to serve all types of libraries and to include all types of materials; this would deal mainly with cataloguing procedures, but through sub-systems would also facilitate acquisitions and lending activities in the various libraries. I was surprised to

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learn that the computerised system currently in use is UTLAS (the University of Toronto's library automation system), which is accessed on-line to Toronto. Establishment of a provincial facility would therefore bring with it very substantial savings in communications costs.

I was most impressed with this co-operative approach to library automation and resource-sharing, and the progress already made, which, I was assured, outstripped the achievements of any other province. While much of the credit must go to the Librarian of the University of British Columbia, Mr. Basil Stuart-Stubbs, for his leading role in these developments, there is little doubt that the positive attitude and financial support of the interested provincial ministries and their related agencies has been an important factor. If the present momentum can be sustained, it is possible that British Columbia may be among the first states in the world to attain the ideal of total library service - a situation where any member of the community has access to the total resources of all types of publicly-funded libraries (school, college, university and public).

As with its innovative approach to the delivery of educational programmes via satellite (see pp. 89-91 above), the British Columbian experience in library co-operation and resource sharing deserves close study by the appropriate state library and education authorities in Australia. This applies with particular force, I believe, in South Australia, where library automation is still, by and large, at an early stage of development, and some significant initiatives are occurring in the provision of joint-use library services between the education sector and local government.

2. Library Planning and Design

The two University Libraries visited - the McLaughlin Library, University of Guelph, and the Sedgewick Undergraduate Library, University of British Columbia - were selected because of their influence on recent academic library architecture. For different reasons, both have attracted a great deal of attention from architects, librarians and others concerned with the planning, design, construction and use of college and university libraries.

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(a) The McLaughlin Library, University of Guelph

The planning principles and processes behind the construction of the McLaughlin Library are described in detail in a monograph "New Library Design: Guidelines to Planning Academic Library Buildings", by the project architect, Stephen Langmead, and the present University Librarian, Margaret Beckman. Although published in 1970, the book remains a land mark in the literature on library architecture, and is still a basic reference for library planners. Having prescribed it in my own lectures to librarianship students at the S.A. Institute of Technology, I was particularly keen to see to what extent the principles outlined in the book had been applied in practice.

I had the good fortune to be given a conducted tour of the building by Mrs. Beckman herself, who described many of its more significant architectural and planning features. She told me that in planning the new Library the Library Building Committee (comprising campus planners, architects, librarians and academics) began with two basic assumptions - first, that it was to be an open access, subject oriented library, with reader space provided among the bookstacks; and second, that the building design must offer extreme flexibility. The latter was considered essential, since at the time (1965) it was virtually impossible to predict the effects of changing technology on library collections, organisational methods and operational systems, and on the needs of library users. (We both agreed that the same need for flexibility applied with at least equal force today).

The McLaughlin Library reflects these two underlying assumptions in the building itself, in the furniture which has been specifically designed for it, and in the organisation of the services offered to staff and student users. The required internal flexibility has been achieved by rejecting the idea of a central service core in favour of containing all essential services - lifts, stairwells, washrooms and ventilation shafts - in four peripherally located towers which rise above the seven floors of the building; this has made it possible to remove all fixed walls from the stack and reader areas. Externally, the top three floors are set back to provide a more sympathetic scale for neighbouring buildings, and to lighten the rather massive elevational treatment of the facade.

The feature of the Library which has attracted most attention is the complete range of custom-designed and manufactured furniture which the architects provided to complement the building design. Approximately 80 items of furniture and related equipment, including chairs, study carrels, office furniture, tables, catalogue and display cabinets, and shelving for books and periodicals, have been designed to provide unity of appearance, combined with variety in arrangement and flexibility in use. The materials used range from tubular steel and leather in the chairs to high-strength wood laminates in the carrels, tables and shelves. One basic shell was developed to suit the specific requirements of each item of furniture - for example, each seven-foot high, double-sided bookstack, constructed of reinforced curved plywood and equipped with its own light fixtures, can be moved fully loaded by a specially-designed lifting truck from one location to another.

The lighting concept is a unique feature designed to give the building the desired flexibility. There is relatively little overhead lighting; instead, fluorescent light fixtures which can be plugged into an underfloor power grid have been mounced on each bookstack and on each carrel. In those areas where flexibility is not required to the same extent, overhead lights are recessed into the acoustic ceiling. Unfortunately, the energy crisis has led to a decision to switch off lights at carrels which are not in use, with the result that some reading areas were in semi-darkness on the day of my visit in early December.

The absence of fixed walls has made possible the functional integration of the book collection and reader services. The collection is arranged in subject divisions - Natural and Applied Sciences, Social Sciences, and Humanities - each of which occupies a separate floor and is easily reached from the tower lifts. Each division has its own specialist reader services' unit and collection of reference books and periodical indexes relevant to the particular disciplines. In addition, computer enquiry terminals are located on each floor, providing information on any item in the collection (i.e. class number, location, on shelf or on loan, date due back, etc.), and enabling prospective borrowers to reserve required items. A variety of study spaces - carrels, tables, closed studies and lounge areas - is provided on each floor.

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Colour has been used imaginatively to provide a unifying theme throughout the building. The furniture, shelving, columns and walls are generally white, but with contrasting accents of red, orange, gold and blue added to some of the interior walls, doors, office desks and carrels. Gold, blue or brick-red carpets and Scandinavian-style wall hangings in bold colours provide further contrasts and contribute to the impression of unity within the building.

The visitor to the McLaughlin Library is struck by the feeling of spaciousness and accessibility created by the absence of interior walls. The emphasis on function and flexibility in the design has produced a building which has proved easy and efficient to operate and capable of accommodating organisational and technological changes with a minimum of disruption. As in all new libraries, some problems have been experienced, but these have mostly been of a minor nature. Overall, I found it an impressive achievement, and I left Guelph with my belief in the necessity of a co-operative team approach to library planning and design reinforced.

(b) The Sedgewick Undergraduate Library, University of British Columbia

The Sedgewick Library has been described as "probably the most venturesome library built since World War II", and has won a number of important architectural awards, including the 1973 First Award of the Royal Architectural Institute of Canada. It is centrally situated on an attractive campus at the western edge of Vancouver, with spectacular views across the Strait of Georgia to the mountains beyond - enhanced in early December by a thick mantle of sparkling snow covering lawns, pathways and surrounding trees.

The site posed a seemingly insoluble problem to the architects - how and where to construct a large undergraduate library in a very limited area adjacent to the existing Main Library, without crowding other neighbouring buildings or encroaching on the Main Mall of the campus, a central walkway 70 feet wide and flanked by large 40 year-old oak trees. The solution adopted was an inspired one - excavating and building below the Mall a two-storey building which meets all the specified requirements without affecting the character and environment of the Mall and surrounding areas. Even the oak trees have been

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retained, by encasing them in red brick retaining walls that now serve as a strong interior design feature on both floors of the library. Additional excavation on the east and west sides of the building has enabled the construction of sunken gardens, providing attractive views from within the library through full-length glass windows that, being below ground level, enjoy unusual freedom from direct sunlight.

Internally, also, the Library possesses a number of innovative features. The main entry area on the upper floor contains facilities for snacks, smoking, rest rooms, lounge and individual study units. Entry to the library proper from this area is through a set of turnstile and inspection points, each of which can be closed off as required by rolling grills lowered from the ceiling. When all grills are down the elements in the main entry then serve as an after-hours study area.

Recordings, the reference, collection, periodicals and technical services are all located on the main (upper) floor. The main stack and reading areas are on the lower level, which is reached via two adjacent spiral staircases (or by lift in the case of handicapped readers). The book stacks extend north and south directly beneath the Mall, while the reading areas are to the east and west, with vistas looking out on the sunken courtyards. The seating is unusually varied, and includes bench seats on both faces of six-foot high cedar panels used to interrupt and define the large expanse of floor space; raised sections of island flooring covered with carpet and numerous three-foot-square hassocks for sprawl seating; a mixture of single and cluster carrels and tables; and demountable octagonal studies used in clusters of six within closed or semi-enclosed rooms. The variety of study spaces and the use of the cedar dividers very effectively avoids the institutional feeling often produced in academic libraries by serried ranks of tables and carrels.

The bold use of colour is another feature of this lower level. The yellow end panels of the stacks contrast (some might prefer to say 'conflict with') the green of the carpet, the bone white of

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the shelves (relieved by an orange book return shelf in the outside bays), the red cedar partitions and the red brick drums surrounding the trees. These colours are taken up and repeated in a supergraphic band which traverses the white-painted solid walls on this floor. One has to admit that the overall effect is striking, to say the least!

The Sedgewick Library occupies a gross area of 113 350 square feet, has a seating capacity of 1 646, and a book capacity of almost 200 000 volumes. Despite the high level of visual interest, and the outstanding architectural features, the relatively simple construction of the actual building resulted in a building cost of less than $2.9 million Canadian ($25.41 per sq. ft.). Total project cost (including furnishings and equipment) came to just under $3.9 million Canadian ($35.15 per sq. ft.).

The remaining libraries visited in Canada were not distinguished architecturally, although interesting from other points of view. However, the McLaughlin and Sedgewick Libraries provide more than sufficient evidence of the high professional achievements of our Canadian colleagues in this as in other fields, and this visitor, at least, is convinced that future study tours by DFE staff to North America should wherever possible include developments taking place above the 49th parallel.

(3) LRC Resources and Services

My programme in Toronto did not include any visits to Community Colleges, and I was therefore anxious to visit some representative Colleges during my stay in Vancouver. With the assistance of the American Library Association HQ staff in Chicago, and later of Mr. Robert Harris of the B.C. Management Advisory Council (see below), a full series of discussions and visits was arranged, taking in two Colleges (Vancouver and Capilano), and two Provincial Institutes (B.C. Institute of Technology and Open Learning Institute). A heavy snowfall which closed roads leading out of Vancouver prevented my visiting the Fraser Valley Community College.

(a) Management and Co-ordination at Provincial Level

The non-university component of post-secondary education in British Columbia consists of 15 Community Colleges and 6 Provincial Institutes.

Under the Colleges and Provincial Institutes Act of 1977/8, the post-secondary system has been re-organised and three Councils have been set up to advise the Minister and government on the sector's requirements: the Academic Council, the Occupational Training Council, and the Management Advisory Council. (A Universities Council has a similar role with respect to the three provincial Universities). From comments gleaned in talks with senior College staff, the structure seems to be viewed by many as bureaucracy rampant!

The Management Advisory Council consists of the Chairman of the Board (or his nominee) of each institution established under the Act, and is chaired by the Deputy Minister (permanent head) of the Ministry of Education. Its particular responsibilities cover administrative matters common to all the institutions, such as budgetary procedures, computing, student counselling and LRC services. In the last-named area the Council's management responsibilities include determination of the levels of funding needed for College and Institute LRC programmes, and the continued support and development of an inter-institutional, resource-sharing network of College libraries.

With the new administrative relationships established by the 1977/8 Act, new provincial budgetary procedures have been introduced which call for precise specification of functions, sub-functions and programmes, and require each institution to prepare consistent data in a programme format - in other words, programme performance budgeting in a context of programme management. With the implementation of these new management tools it was considered desirable to develop consistent standards for LRC programmes which were suited to the British Columbia scene, and could serve as quantitative management indicators for establishing funding levels and development priorities. Senior LRC staff were seconded for the purpose.

Despite the difficulties inherent in drafting a set of management indicators which would be applicable to the very diverse patterns of LRC provision in more than 20 institutions, and acceptable to all the components of the post-secondary system, impressive progress has been made in identifying those areas needing quantification. Two detailed

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reports have been issued (9, 10) and a comprehensive roles statement developed (see following page). Work is proceeding on the collection of data in a format which will be consistent with a programme management approach to the Colleges' instructional budget, and the need for a standardised evaluative tool which can be used to assess LRC's as part of the institutional evaluation process is being studied.

The introduction of PPB and programme management in our Department will require the development of quantitative criteria for College LRC programmes which can be applied to the process of establishing funding levels and priorities. Little relevant data is presently available, and in my view the pioneering work carried out in British Columbia will prove most helpful in tackling this problem. We should, I believe, follow their example and consider seconding one or two senior LRC staff for a limited period (possibly 2 months) to carry out the following tasks:-

(i) develop a roles statement for College LRC's;
(ii) review the British Columbia management indicators for LRC programmes and any other relevant guidelines/standards for TAFE-type Colleges;
(iii) develop comparable criteria suitable for application in DFE programme management.

(b) LRC's in Colleges and Institutes

The Vancouver Community College operates on three separate campuses - the Vancouver Vocational Institute close to the city centre, the King Edward Campus and Langara Campus. In 1979/80 student contact hours totalled almost 8.5 million; there were 627 academic staff, 333 support staff, and 44 administration. Major re-development plans are in hand, with reconstruction of the VVI about to commence on its existing site, and the Kind Edward Campus scheduled to move to a new site within the next 3 years.

The Director of College Resources, Mr. Ross Carter, accompanied me on visits to all 3 campuses. He has overall responsibility for Library

(9) HANAFI, W.E. and HUSBAND, B.E. "Report of the British Columbia College and Institute Learning Resources Centre Standards Project. Phase I." Vancouver, 1979.

(10) WELWOOD, R.J. "Management Indicators for British Columbia College and Institute Learning Resources Centres: an Interim Report". Vancouver, 1980.

B.C. COLLEGE AND INSTITUTE LEARNING RESOURCE CENTRE ROLES STATEMENT

1. Provides the space, equipment and material resources necessary to meet the needs of the College or institute community within the context of the college or institute mission statements. These resources are provided at a level consistent with identified provincial standards, and in the case of some programmes, an accreditable standard.

2. The level of learning and resources, for example, needed to support faculty members' professional development may vary from institution to institution depending on their proximity to other resource centres. Therefore, the learning resource requirement should exceed the level required to meet solely the curriculum needs. This statement includes the learning resource support requirements for community education and for non-credit programmes.

3. Provides a sufficient number of qualified personnel to obtain the resources for the functions of the centre; to organise these resources; and to ensure that effective use of resources can be made by students, staff, faculty members and community members.

   This statement includes assisting faculty members in making the best use of the Learning Resources Centre in the teaching process.

4. Provides for effective access to, and instruction in, the use of learning resource centre resources.

5. Participates in the operation and development of library networks at the local, provincial, national and international levels.

6. Provides adequate physical facilities to enable effective use of learning resource centre services.

7. Co-operates with libraries and other agencies in the community and province in the supply of learning resources and reference expertise to citizens of the community at both a technical and cultural level, avoiding unnecessary duplication, but duplicating where necessary, and avoiding the usurping of other agencies' community responsibilities.

8. Acts as a centre for the access to, and dissemination of, municipal, provincial and national government information for the college or institute community.

9. Where required, takes responsibility for archival, museum and other related functions in the community in agreement with other community and provincial jurisdictions.

10. Acts as a regional or provincial distribution centre for learning resources developed and supplied by other educational agencies.

11. Acts as a centre for the access to, and dissemination of, information and materials related to cultural exchange on the local, provincial, national and international levels.

12. Acts as an advocate for the college community in the articulation and provision of community learning resource centre needs where inter-ministerial agreement participation is needed.

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and Audio-visual Services, which together employ 65 staff; the professional staff in both areas have faculty status. The A/V Services department is administered as a separate unit (i.e. as distinct from the Library) and its main functions at the present time are seen as equipment circulation and maintenance, and software utilisation. More than 4 500 hours of closed-circuit television service were provided to instructional users during 1979/80, and I learnt from Mr. Carter that plans were in hand to provide the first telecourses through the community cable system in the coming year.

Library holdings in 1979 totalled 120 000 items, including books, serials, microforms, films, videotapes, sound recordings and multi-media kits. Except for the Library on the Langara campus, which was housed in a separate building on four floors, physical facilities were less than adequate; however, the re-development proposals provide for new quarters on the other two campuses, with improved study spaces for students and more accommodation for books and other learning resources.

Along with the other Colleges and Institutes, Vancouver Community College is participating in the computerised cataloguing system, with on-line access to the UTLAS data base at the University of Toronto. Mr. Carter considered that the co-operative approach had proved successful, and had made possible decentralisation of information about the library collections; microfiche catalogues of the entire holdings have been supplied to the three campus libraries and also to extra-mural centres where continuing education classes are held.

Capilano College is situated in North Vancouver in a most attractive wooded setting. In addition to the main campus it operates several branches up to 60 miles distant. The majority of the 3 200 students enrolled are undertaking university transfer courses (a feature of the College system in British Columbia), but adult basic education and community education programmes are also offered.

I was met on arrival by Mrs. Caroline Price, the Media Centre Co-ordinator. Media Centre is the term adopted by the College to describe its learning resource centre, and the position of Co-ordinator has been created to replace the customary post of Chief Librarian or LRC

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Director. Following a restructuring of the College administration in 1978/79, and the appointment of a Dean of Instructional Services (whose area of responsibility includes the Media Centre), the Centre adopted a new administrative structure on a model resembling the organisation of academic areas within the College. One of the professional staff is given release time to act as Centre Co-ordinator, for one year, and is responsible for reporting to the Dean; other professional staff are appointed as co-ordinators of units within the Centre such as Technical Services, Media Production, and Circulation and Reference.

This was the first time I have come across this particular administrative structure in an LRC setting, and the system of shared co-ordinatorship struck me as having some advantages over the traditional LRC heirarchy - particularly in a situation where the professional staff all have faculty status. Not only does it allow administrative responsibilities to be shared, as in a teaching department, but it requires more participation, a higher degree of co-operation, and a broader view of the Centre's activities by the professional staff. As far as I could judge in a brief visit the system appeared to be functioning satisfactorily and to be supported by all concerned.

As the Centre's name implies, library and media production services are integrated administratively, though physically separated due to the layout of the campus and the cramped accommodation in the main library. Staff in 1980 numbered 30, of whom 4.5 were professional, with faculty status. The collection contained some 80 000 print and non-print items. Conversion of the catalogue into machine-readable form via the UTLAS system had been completed shortly before my visit, and the cataloguing staff spoke very favourably of the effect of the new computerised system in maintaining a fast and even flow in the processing of new materials.

The British Columbia Institute of Technology at Burnaby was the largest of the institutions visited, with approx. 3 200 full-time and 20 000 part-time students (including some 2 500 correspondence students). It provides a wide range of two-year Diploma programmes in Business Management, Health Services and Engineering, together with a small number of third year programmes in course areas (e.g. Radio Engineering) not available in the universities.

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The BCIT Library is recognised as the major technological information resource centre in the province. The Library contains well over 200 000 items in all media formats, including an extensive microfiche collection; services offered include reference searches by technology specialists, seminars on library use, and workshops for producing slides and transparencies. The administrative structure is similar to that at Vancouver CC, with the one Director administering separate library and audio-visual services.

The Library is housed in a relatively new building of about the same size as the LRC in Elizabeth Community College. Excellent facilities are available for the use of A/V resource materials within the building, including two viewing booths for 16mm films. Students also have access to computer terminals for course-related purposes. Library staff number about 50, with all professional librarians having faculty status.

Obviously there are significant differences between the Colleges and Institutes in British Columbia and Colleges of Further Education in South Australia. The former have some of the characteristics of our Colleges of Advanced Education; although they do not offer degree programmes, a substantial number of their students are taking university transfer courses. There are also similarities with further education, such as the provision of trade training in some institutions, and of continuing education (enrichment) programmes in others. Although it would be misleading to make exact comparisons, I could not help but be impressed by the relatively advanced state of LRC collections and services in the British Columbia post-secondary system: The size of most College collections, the proportion of operating budgets spent on learning resources, the numbers of LRC staff, and the faculty status enjoyed by library and media professionals all testify to a general recognition of the crucial role of the LRC in the instructional/ educational process. With few exceptions TAFE in Australia has yet to accord this degree of recognition to LRC services, which historically have been starved of funds, resources, and staff.

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D. DISTANCE EDUCATION

Canada, like Australia, is a big country with a population distributed unevenly between densely populated metropolitan centres and sparsely populated rural areas. In both countries the educational system must offer more than the traditional classroom format if all citizens are to have equal access to educational opportunities. Distance education, as the most flexible mode of delivery within a total system, provides a means of access for those potential students unable to attend classes on campus.

In recent years there has been considerable growth in distance education in Canada (due in part at least to declining on-campus enrolments), and I took advantage of my visit to look at some current activities in this area. I have described above the innovative 'open-sector' programming and telecourses being developed by the Ontario Educational Communications Authority and the Knowledge Network of the West (pp 81-91). In addition, I was able to examine the more formal distance education programmes offered by the Distance Education Office at Ryerson and the Open Learning Institute in Vancouver, both of which provide a range of correspondence-type courses for academic credit.

(1) Distance Education Office, Ryerson Polytechnical Institute

The Distance Education Office is a unit of Ryerson's Continuing Education Division. At present it operates with limited facilities and with only one full-time academic staff member - the Co-ordinator, Ms. Susan D'Antoni. Six Certificate programmes are currently offered, in Auditing, Business Administration, Electronic Technology, Office Administration, Public Administration, and Social Service Administration; the programmes consist of between 4 and 6 courses, and generally reflect the content of equivalent classroom-based certificates. A number of professional programmes, prepared in collaboration with the relevant professional associations, are also offered.

Ms. D'Antoni told me that although her Office and the radio-based Open College both come under the Continuing Education Division, there has been very little formal liaison between the two units. However, the entire distance education concept is currently under review, and a detailed

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proposal has been prepared which envisages the possible expansion of the programme to include diploma and degree level courses; joint development and presentation of courses with the Open College and other academic institutions; and collaboration with the OECA in testing and evaluating that organisation's satellite-based delivery systems.(11)

(2) The Open Learning Institute of British Columbia

Established under the Colleges and Provincial Institutes Act in June 1978, the Open Learning Institute provides home-study courses to adult British Columbia residents who are unable or unwilling to attend conventional teaching institutions. Courses are offered in three broad areas of study - Adult Basic Education, Career/Technical/Vocational Education, and University-level programmes leading to a first degree in arts or science. Approx. 2 000 students were enrolled at all levels at the time of my visit.

The Principal, Dr. Ron Jeffels, informed me that OLI is modelled to some extent on the Open University in Britain. Similar emphasis is placed on student support systems (particularly counselling and tutorial services) as a means of providing the personal, individualised contact with students considered necessary to maintain motivation and avoid high drop-out rates. Each student has telephone access (toll-free) to a designated tutor; the Institute provides all tutors with a separate phone and pays the phone bills. Counselling services are provided by full-time advisers located in several provincial centres; their role is to direct students to the courses best suited to their particular educational needs, and after enrolment to assist with any academic and non-academic problems that may arise.

Mr. Dick Scales, OLI's Director of Provincial Programmes, explained the procedures for course development and delivery. Course development is co-ordinated by full-time Institute staff working in close collaboration with contracted course writers who are specialists in their field. The material produced is then revised and refined by course designers, visual designers, outside consultants, and (where possible) students. The final text is typed and corrected on word processors and printed (in black and white only) in the Institute's very well equipped print-shop. I was told that production averages 1½-2½ million pages per month.

(11) Ryerson Polytechnical Institute. "The Development of Ryerson's Distance Education Potential." Nov. 1979

Delivery of OLI distance education programmes is largely print-based at present, but other 'remote communication channels' (i.e. audio tapes, radio, TV, telephone and computer) are also used to supplement print. Considerable use is made of relevant materials produced by other agencies (such as the Open University), modified where necessary to suit Canadian conditions. Commercially published textbooks are also purchased in bulk and supplied to students as part of the course fee.

I was interested in the arrangements made to meet the library needs of OLI students. It is considered that for many courses (particularly Adult Basic Education and career and vocational programmes) the packaged materials and other media will prove adequate; if supplementary reading is required, it can usually be obtained through British Columbia's excellent public library system. On the other hand, OLI recognises that a package or textbook approach to university level study, where wide and free reading is often required, would be less than desirable, and has therefore introduced a telephone 'hot-line' service for these students. They are able to phone an OLI librarian based at Simon Fraser University Library with reference and borrowing requests; both books and photocopies of periodical articles are sent to off-campus students, with the costs being met by OLI. It is also proposed to introduce an extra-mural borrowers card which will entitle all distance students in the province to library service at the academic library closest to them geographically, at the cost of the institution at which they are enrolled.

Apart from the inclusion of university-level courses, the Open Learning Institute has some similarities with our Open College. With generous government support it has been able to develop a system of comprehensive student support services which must surely be the envy of other distance education providers. There is, however, some criticism within British Columbia itself of its activities - for example, I found it surprising that many OLI courses at both degree and other levels are claimed to duplicate similar courses already well-developed and offered by other institutions in the province. Surprisingly, too, there appears to have been little co-ordination between OLI and the Knowledge Network of the West, which is developing its own brand of distance education. I gained the impression that the Post-secondary Councils will need to address the problems of co-ordination and rationalisation of distance education services before the present pattern becomes too firmly established.

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V CONCLUSIONS AND RECOMMENDATIONS

It was no surprise to find that the three countries visited in the course of the tour were all experiencing serious economic difficulties - inflation, recession, and high unemployment - with consequent cutbacks in funding for education and related services such as libraries. Nevertheless, despite the severe impact of these cuts on many education programmes, it was noticeable that major initiatives involving the new communications technologies were still being pursued - for example, their application to educational delivery systems on the one hand, and to information dissemination on the other. Similarly, computer-based education in its various forms appears to be firmly established at all levels of education, and the advent of the micro-computer has at last made available a very flexible and powerful teaching medium that can be considered cost effective for most users.

The influence of the new technologies on everyday life is more immediately apparent in the U.K. and in North America than is yet the case in Australia. In England teletext and Prestel are readily available, if not yet household terms; cable television is spreading rapidly throughout North America, and in the view of some commentators could reduce the major TV networks to 24-hour transmitters of news by the end of the decade; satellite communications are being widely used for data transmission, teleconferencing, and educational broadcasting as well as for telephone and television links; the video disc is mounting the long-awaited challenge to the videotape; and electronic publishing is now recognised as a commercially viable alternative to print in some areas and several major publishers have entered the field.

The consequences of these developments for education, for libraries and information services, and indeed for society as a whole, are being widely debated in professional forums and in the mass media. Some writers see technological change as the panacea to cure the education system's ills, others as the means to replace educational institutions with a multitude of home learning centres. For library services the marriage of computers to telecommunications is viewed as both a challenge and a threat, on the one hand hastening the decline of the printed book and newspaper, but on the other bringing undreamt-of opportunities for communications specialists and skilled data base searchers on library staffs. The only sure area of consensus is that tremendous changes are in store during the eighties, and that professions such as education and librarianship likely to be in the forefront of change must prepare their members now for the challenges ahead.

A. Educational Communications and Technology

(1) Screened Data Systems (Teletext and Videotex)

Significant developments have occurred in Australia since my return. Teletext is being transmitted on commercial television in Sydney and Brisbane, is being trialled in Melbourne, and is under investigation by channel 7 in Adelaide. A growing number of Australian subscribers are using the British-based International Prestel service, marketed as Contex, and in 1982 will be able to access the full British domestic data base (as the Educational Technology Centre is already doing on a trial basis). Although the Australian government has now decided not to allow Telecom to proceed with a national public videotex service based on Prestel, it is actively encouraging the private sector to develop a domestic service. The Myer Communications group is reportedly finalising its negotiations to introduce the Canadian Telidon system as the first commercial service.

Apart from the limited trials being carried out by the Educational Technology Centre, there is apparently little interest being shown in assessing the educational potential of teletext and videotex systems in Australia. Yet there can be no doubt that the technology will be readily available here in the next few years, and the applied research now underway in the United Kingdom and Canada clearly indicates some exciting possibilities - such as exchanging educational 'telesoftware' via the telephone network between a number of centres, and providing some educational programming directly to students in their own homes.

The extent to which these educational possibilities are realised in practice remains to be seen. However, the technology's proven potential for disseminating educational information, for data transmission and for information retrieval suggests that at the very least it will be adopted and utilised for these and related administrative purposes in due course. It is therefore important that current research and development in this area should be closely monitored, and that contacts established with overseas organisations such as the Council for Educational Technology in the U.K., and the Ontario Educational Communications Authority, should so far as possible be maintained.

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I RECOMMEND that ongoing research and development in the educational applications of teletext/videotex technology be kept under close review, and that funds be provided in 1982/83 to allow a limited programme of educational trials to be developed through the Educational Resources Branch and the Open College of Further Education.

(2) Computer-based Education

The tour gave me a much clearer appreciation of the revolutionary nature of the changes which the availability of low-cost micro-computer technology is creating in education. Institutions at all levels from primary to higher tertiary are now able to use computers in a variety of learning/teaching activities and programmes at an easily affordable cost. At the same time, advanced microprocessor technologies have enabled these low cost computers to interface with a range of audio-visual devices, greatly increasing their capability to present colour, graphics, animation, and sound reproduction.

Although the institutions and organisations visited provided a highly selective picture of the present 'state of the art', nevertheless I was left in no doubt that the Department is lagging dangerously in this most important area of educational development. In the body of this report I have referred several times to what I am convinced is a pressing need for DFE to develop computer literacy courses - both for the general public and, more importantly, for our own teaching staff. If our educational programmes are to take full advantage of the unique capabilities of the new technology to adapt instruction to the needs of individual learners, it is essential that our teachers should themselves be educated in the most effective use of computer-based systems. They will undoubtedly need help and guidance about what computers can and cannot do, and how computer-based systems can make learning experiences more effective and more meaningful for the student.

I RECOMMEND:

(a) that immediate attention be given to the development of in-service courses, seminars and/or workshops to familiarise teaching staff with the various uses of computers in education, and to provide appropriate training in the design and utilisation of computer-based instruction;

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(b) that as a matter of urgency the Curriculum Development Branch be asked to examine the inclusion of computer literacy components in relevant course areas; and

(c) that a detailed investigation of the potential applications of micro-computers in education and training, including appropriate field trials, be carried out under the aegis of the Computer Committee.

(3) Interactive Video

Some very significant developments are currently taking place in the design of video learning systems which are responsive to the learner's needs. In the past year or two video has become interactive - i.e. with the use of a programmed control device the images on a video disc or cassette can be presented in an order determined by, and appropriate to, the responses of individual learners.

Although it is the video disc's potential in this area which seems to have attracted most attention, in fact comparable developments have been taking place in videotape technology. Controls are now available that will link micro-computers with standard ½" or ¾" video cassette players equipped with a jack port for remote control, enabling the required audio and visual information on the tape to be located automatically and played back in any required order over a conventional TV receiver.

Because videotape technology is relatively inexpensive and has already gained general acceptance in education, the initial impetus for adoption of interactive video may well come in this area. This would seem to be the view of the Sony Corporation, which has introduced a Betamax-based responsive system in the United States, and is now running workshops and training sessions throughout the country on the system's use and, just as importantly, on the production of programming for it.

While responsive video is likely to make an appearance in Australia in the near future, I hesitate to predict its rapid adoption by the education sector, given its present straitened circumstances and innate conservatism.

Nevertheless, I believe that (as with the other technologies described in this report) it is highly desirable that educational media specialists in the Department should be aware of, and gain experience with, the systems that are now becoming available. We need to experiment to find out those applications in which they will be most useful, and to ascertain whether or not the new techniques now being developed are educationally effective, and their cost in comparison with that of conventional methods.

I RECOMMEND that the Department set up a task force of media specialists, under the chairmanship of the Principal Education Officer (Media), Educational Resources Branch, (1) to investigate possible educational applications of the video disc in DFE programmes; and (2) to establish, in consultation with computer specialists, the hardware and software requirements needed to carry out appropriate field trials of video responsive learning systems.

(4) New Technologies in Distance Education

Both in the United Kingdom and North America trials of the new communications technologies as educational delivery systems were in progress. Applications of particular interest were the Open University's testing of the Cyclops system as a means of audio and visual communication between tutor and student via the telephone; the educational uses of communications satellites and cable television in the United States; and the wide-ranging programmes being developed by the Ontario Educational Communications Authority and the Knowledge Network of the West in Canada.

It may well be some years before some at least of these applications become a practical possibility in Australia. The first domestic satellite is still several years distant, and a government decision has yet to be made on the introduction of cable television. Nevertheless, there can be little doubt of the potential of these technologies to extend educational opportunities, and continued monitoring of current trials and of ongoing programmes such as those in British Columbia is therefore warranted.

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I RECOMMEND that the educational applications overseas of the new communications technologies (such as the communications satellite) be monitored on a continuing basis, and that the Department participate in any national trials that may be initiated in this area.

(5) Educational Broadcasting (Radio and Television)

Markedly greater use is being made of the broadcast media for post-secondary education in the U.K. and North America than here in Australia. This is particularly the case with television, but I was surprised at the extent to which radio is still being utilised by educational agencies on both sides of the Atlantic. Although much of the current radio use is informal in nature, formal courses continue to be presented on a number of stations in the United States and Canada, and National Public Radio is developing some excellent educational programmes for transmission on public stations in association with local post-secondary institutions. The BBC has maintained a strong commitment to continuing education programmes on radio, while many of the Independent Local Radio Stations (such as Piccadilly Radio in Manchester) are also involved in a range of broadly educational activities. It is clear that radio remains a versatile and practical educational medium which has much to commend it as a supplementary delivery system, particularly when it is linked with community education programmes at the local level.

I RECOMMEND:

(a) that DFE continue to develop general educational programming for transmission on public broadcasting stations such as 5UV and 5EBI;

(b) that local Colleges of Further Education be encouraged to co-operate with community groups such as Para Broadcasters and Blue Lake Community Broadcasters planning to establish community radio stations; and

(c) that the Radio Programme Advisory Committee be asked to report to Executive on the future use of radio in departmental programmes.

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Television remains the most potent of the mass media for educational purposes, and major developments are under way in the U.K. and the U.S.A. The advent of the fourth T.V. channel in Britain in 1982 will substantially increase the amount of 'prime time' devoted to educational programmes for adults, while in the United States the Public Broadcasting Service has now inaugurated its Adult Learning Program Service (or College of the Air), with more than 50 public television stations carrying for-credit courses and 'wrap-arounds' (i.e. series such as 'Cosmos' designed for general audiences but which are also suitable for inclusion in college curricula).

Unfortunately there is very little prospect of any comparable developments taking place in Australia in the foreseeable future. There is no statutory obligation upon either the ABC or the commercial stations to provide educational programming. The recent report of the Committee of Review of the ABC (May 1981) recommends against such a statutory requirement, although it does support the continuation of the Commission's existing programming for primary and secondary schools. While recognising that a need exists for educational programming in the areas of adult and continuing education, TAFE, and distance and special education, the Committee concludes that the ABC's existing broadcast outlets are insufficient to meet these educational needs, and suggests that alternative avenues will need to be investigated. These include the potential use of the new Multicultural Television channels in the capital cities as they become available, supplementary licenses for regional T.V. stations, the domestic satellite, and cable and pay-T.V. Although the report refers to the broadly educational nature of some of the ABC's general programming, it does not comment on the potential use of such programmes as components of adult or continuing education courses (as is happening in the U.K. and U.S.A.).

I RECOMMEND that the Department initiate a feasibility study of the use of a general output television series in an enrichment/continuing education programme, preferably in collaboration with the Australian Broadcasting Commission.

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(6) Educational Technology Units

The Community Colleges visited in the United States and Canada, and the Polytechnics visited in the United Kingdom, all had active specialist units concerned with the design, development and use of learning resources and the improvement of instructional methods. Although the titles of these units varied considerably (as did their relationship to other service units, such as the library), their general aims were broadly similar: to increase the effectiveness of teaching and learning in the institution, through support and improvement of existing teaching methods and the development and production of learning resources; and to act as a catalyst in introducing new methodologies such as individualised instruction and resource-based learning.

My observations of these various units, and discussions with their staffs, confirmed my view that little significant change will take place in teaching methodologies in our Department unless and until similar units are established in the larger Colleges. For example, while the production facilities at Educational Multi-Media compare very favourably with those in the institutions visited, the educational product is being used almost exclusively as an 'add-on' component in conventional teaching rather than as an integral part of a planned resource-based programme. The effective exploitation of instructional media and technology in our Colleges is dependent on the appointment of specialist educational technologists, who can work with their classroom colleagues in improving teaching and learning skills and in designing, producing and evaluating learning resources for course use. Apart from the Open College, only three Colleges have made such appointments to date, and in each case the appointee has had little opportunity to fill a creative role due to the heavy demands made on him/her for routine maintenance and production, and to the lack of technical support staff. In contrast, educational services/technology units in the larger Victorian TAFE Colleges generally include at least two educational technologists plus several technicians and/or technical assistants.

I RECOMMEND:

(a) that DFE adopt as policy the establishment of educational technology units in all larger Colleges;

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(b) that the Educational Resources Branch undertake a survey of present media production facilities in Colleges and make recommendations for the introduction of educational technology units (including staffing requirements) where appropriate;

(c) that urgent consideration be given to the secondment of a suitably qualified/experienced lecturer to the Branch to assist the Principal Education Officer (Media) undertake the proposed survey and to develop and implement proposals to improve the use of media resources and services in educational programmes.

B. Libraries and Learning Resource Centres

(1) The LRC as a Learning Centre

The Learning Resource Centre of the type now commonly found in North American Community Colleges, and more recently introduced into a small number of British institutions, has evolved from traditional library and audio-visual services operating independently of each other. The fully-fledged LRC, as at DeAnza College in California and at Brighton Polytechnic in the U.K., brings learners and teachers (students and faculty) together in an integrated learning environment where library, AV production and instructional development services function as a co-ordinated whole in support of the institution's educational goals.

The conditions necessary for learning to take place through the LRC, as envisaged in this concept, include the provision of sufficient numbers of professional and support staff to provide the necessary specialist services; the acceptance by teaching staff of the learning resources specialists (both library and media) as full partners in the learning/teaching process; general recognition of the LRC as the campus centre for educational innovation and non-traditional approaches to learning; and a building facility designed to bring about the necessary interaction between the LRC's component parts (library, media production, instructional development, and non-traditional learning). Where all of these conditions are met (as in some of the better-endowed U.S. Community Colleges), the concept of the LRC as a learning centre appears to have been effectively realised in practice.

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Only three of the Department's Colleges at present have LRC facilities which have been expressly designed with this concept in mind - Elizabeth, Gilles Plains, and Noarlunga. No College even remotely approaches the other three criteria mentioned. Educational technologists, as indicated in the previous section, are conspicuous by their almost total absence in DFE; Lecturers (Resource Centre) are so heavily committed to routine administrative duties that they have little if any opportunity to fulfill their proper educational role; professional librarians spend much of their time on sub-professional duties because of the lack of support staff, etc. With few exceptions subject specialists in the teaching departments judge LRC professional staff by the administrative and clerical duties they are perceived to be carrying out. Having seen the 'vision splendid' in operation in Colleges such as DeAnza, I believe that a similar development is feasible in our larger Colleges - but only if there is a significant change of departmental priorities and a re-direction of resources away from traditional teaching practices into new initiatives such as resource-based learning.

Such a move must be considered unlikely unless and until the educational effectiveness of such methods can be successfully demonstrated in the College situation. This will require the development of a pilot field study in one or two of the larger metropolitan Colleges possessing adequate LRC facilities, and will necessitate the creation of additional LRC staff positions (perhaps at the expense of other teaching and ancillary posts). In practice such a study will need to be implemented at either Elizabeth or Gilles Plains, as no other College currently has adequate physical facilities to support such a programme. If, however, present constraints are felt to be such that they would preclude a successful trial at either of these locations, then serious consideration should be given to nominating the new Noarlunga College for a demonstration programme. Here at least the library component will be adequately staffed and stocked, and with the addition of a small educational technology unit most of the essential pre-requisites for an effective college learning resources programme will be met.

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I RECOMMEND:

(a) that a pilot learning resources programme be developed for implementation at Gilles Plains Community College and/or Elizabeth Community College for a three to five year period (commencing in 1983) to demonstrate the contribution that LRC materials, facilities and specialist staff can make to the total educational programme within the College;

(b) that funding for the pilot programme (including salaries support) be sought from the Commonwealth particular purpose TAFE grant to the State as a new initiative for the 1983 calendar year (and the following two to four years);

(c) that in addition consideration be given to the appointment of a Lecturer (Resource Centre) and technical support staff to the Noarlunga Community College (as provided for under the terms of the agreement with the City Council) to develop AV production and instructional development services and ensure that library services are effectively integrated with College programmes.

(2) Innovative Technologies in Libraries

Several of the technologies described in section A above are certain to have as great (or greater) an impact on library services as on education. Already international satellite communications enable searchers in the Education Centre, Adelaide, to retrieve information direct from a range of data bases in North America. Technological innovations now under development will make possible the integration of these information retrieval services with electronic document delivery services, transforming the reference function of the academic and research library. On-line printers will supplement display terminals, providing immediate and inexpensive print-outs of the full text of the required document(s).

An innovation which will benefit smaller libraries, enabling them to manage their resources and disseminate information more cost effectively in the future, is the microcomputer. Advances in microprocessor technology, bringing significant increases in processing speed, memory

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and disk referencing capacity, will soon allow all routine library functions (such as ordering and cataloguing, checking receipt of periodicals, circulation of materials, etc.) to be handled on small in-house systems at a substantially lower cost than for today's minicomputer systems.

Developments in computing and communications have provided the stimulus for the growth of networking which, especially in North America, has led to greatly increased co-operation and resource sharing between libraries. In addition to the sharing of catalogue records on-line, the network's ability to provide information on local holdings has facilitated inter-library loan and has the potential to rationalise the process of collection development, so that reduced budgets can be put to the most effective use. The recent inauguration of the Australian Bibliographic Network by the National Library of Australia will provide the basis for similar developments in this country, including shared cataloguing and the establishment of on-line union catalogues at state and national levels.

An interesting innovation, which I saw at the College of DuPage in Illinois, is a touch-sensitive terminal which enables library users to access an on-line catalogue without having to use a keyboard. This type of terminal, which actually makes the on-line catalogue easier to use than a conventional card catalogue, is now being demonstrated in Australia.

A word of warning may be in order here. The computer technologies which have already been introduced into libraries have, by and large, helped to overcome the limitations of manual techniques, and to extend the scope of information and reference services. In contrast, some of the newer technologies which are now on the horizon have the capacity not only to alter profoundly the nature of the product handled in libraries, but indeed to impose entirely new patterns of access to, and use of, information resources. The tradition of free availability of books and information has already been compromised by the practice in some libraries of charging tariffs for computer searches, which has

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established a de facto distinction in the conditions of availability according to the technology used to provide the service. The extension of this concept to more traditional areas of service (e.g. the recent imposition of fees for inter-library loan by some libraries) may signal the first stages in the emergence of a society split between the information rich and the information poor.

To help counter this tendency it is essential, in my view, that libraries of all types should formulate their aims and objectives with considerably greater care than in the past, to ensure that scarce funds are spent on those resources and services best calculated to meet the needs and interests of their primary client groups (such as students and teaching staff in the case of a College LRC, or various community groups in the case of a public library). When consideration is given to the introduction of an innovative technology, the projected benefit of the innovation to particular client groups must be carefully weighed against the possible detrimental effects on others of curtailing some existing services, before any final decision is made.

I RECOMMEND:

(a) that the Department continue planning for the staged introduction of automation into library operations;

(b) that the Department continue its participation in the Australian Bibliographic Network in co-operation with the State Library and Public Libraries Division, Department of Local Government;

(c) that in 1982 a Lecturer (Resource Centre) with relevant experience be seconded to the Educational Resources Branch to co-ordinate automation developments in College LRC's; and

(d) that all Colleges with staffed LRC's be advised to develop a mission statement for the LRC, based on the College's educational goals and reflecting the specific needs and interests of students and staff, which can be used to measure the LRC's performance and can also provide a means for evaluating the introduction of new technologies (including computer-based systems).

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(3) Library Buildings: Planning and Design

I do not claim to possess expertise in the field of library planning and design. Visiting the academic libraries described in this report I assessed the buildings from the standpoint of a library user and not that of an architect or designer. Nevertheless I gained some positive impressions which I believe are pertinent to the Department's future planning in this area.

It appears that present economic constraints and the changing functional requirements of libraries are beginning to impose greater uniformity on library exteriors, as evidenced in the most recent architecture. For example, the highly individual external design of the Joseph Regenstein Library at the University of Chicago, completed in 1970, has given way to the standard rectangular lines of the Cecil H. Green Library at Stanford University opened ten years later. In the most recent buildings, designed since the energy crisis of the early seventies, much greater attention has been paid to such factors as siting, fenestration and insulation to take full advantage of their potential for energy conservation. Solar energy is being investigated as an alternative energy source, but its application at present seems limited to supplemental heating systems.

One result of the energy crisis has been the decrease in recommended lighting levels in new libraries. Whereas ten years ago engineers were proposing intensities of as much as 100 foot-candles at reading surfaces, this has now dropped to the 40 foot-candles commonly provided in the 1950's. The flexible lighting concept at the McLaughlin Library, University of Guelph, which eschews overhead lighting in favour of light boxes on the supporting columns and fluorescent lights mounted on individual book stacks and study carrels, has demonstrated its energy and cost-saving potential in today's circumstances (although it is rather disconcerting for the visitor to find large parts of the reading areas in semi-darkness at times of low student use).

The need for the greatest possible degree of interior flexibility to accommodate technological change is self-evident. Library design has to take account of changed (and changing) requirements for processing,

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storing, and providing user access to new types and formats of information and learning resources to supplement conventional printed materials. As cassettes (audio and video), microforms, films, multi-media kits, overhead transparencies, slides, etc., come to represent higher and higher proportions of library collections (more so in community college-type institutions than in the larger research libraries), the specific space requirements for their storage and utilisation become of correspondingly greater importance.

Provision of appropriate spaces for computers (mini or micro) and their associated terminals, VDU's, printout equipment and software, together with the attendant staff, is now a necessity for even the smallest academic library with any pretension to providing a service to students and faculty. User access to this equipment and material brings its own requirements for spaces for terminal enquiry, control and security provision.

Two other aspects of current planning and design are worth noting. Firstly, the trend towards increased provision of audio-visual materials in college libraries, already noted, is even more marked in North America than in Australia, and further strengthens the case for constructing Learning Resource Centres consciously designed to facilitate the integration of library, AV production and instructional development services in a single facility. Secondly, the escalating costs of both space and materials are leading many institutions (especially those with no commitments to ongoing research programmes), to question the assumption of continued collection growth and consequent building expansion. In this climate the concept of the 'steady-state' library, based on maintenance of a working (or currently effective) collection at a relatively fixed size, is gaining acceptance, and it seems likely that architects and library planners increasingly will be required to determine final space requirements on the basis of the predicted range of services to be offered, potential user load, and a carefully planned fixed-size collection. In other words, they will need to strive for maximum flexibility within rigorously determined spatial limits rather than expect to solve space problems with subsequent expansions.

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I RECOMMEND:

(a) that in its building planning the Department continue to employ the design concept of the Learning Resource Centre as outlined, incorporating library, AV production and instructional development services, together with non-traditional learning programmes and study spaces, in a single, integrated facility;

(b) that in designing College LRC buildings particular attention be paid to the need for maximum interior flexibility, to ensure that future technological innovations can be incorporated with minimal disruption to the building and to the operation of existing services.

(4) Joint-use Library Services

Although I was able to visit only one operational joint-use library in the course of the tour - that at the Abraham Moss Centre in Manchester - I took the opportunity to discuss their establishment with officials of the Office of Arts and Libraries in London, and with staff of the American Library Association in Chicago. In both cases considerable interest was shown in Australian developments in this area, and there seemed to be a general belief that this form of co-operation would increase as education and library budgets tightened.

In England, with the exception of the community library at Abraham Moss, which itself is a combined public/secondary school/further education college library similar in concept to that at The Parks, only one example of a shared public and college library service was cited to me. Although a number of the Community/Village Colleges in Cambridgeshire and Leicestershire incorporate small public library branches on the premises, the Colleges themselves are essentially schools with adult education wings attached.

This form of resource sharing is rather more common in the United States. Approximately 130 combined school/public libraries are believed to be operating at the present time, and according to a 1978 study (12) more than 40 Junior and Community Colleges share

(12) Drake, S.L. and Lynch, M.J. "Community Colleges, Public Libraries, and the Humanities: a study of co-operative programs. Final Report". Washington, American Association of Community and Junior Colleges; Chicago, Public Library Association, 1978.

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library service with public libraries. However, the ALA headquarters staff were only able to identify for me three or four examples of such combined college and public libraries; interestingly, the most long-standing example of such co-operation at the post-secondary level involves the University of New Hampshire, which has also served as the public library for Durham, N.H., since 1907.

Growing interest in the concept is becoming evident on both sides of the Atlantic. In the United Kingdom, for example, the Centre for Library and Information Management at Loughborough has been asked to investigate the problems that would arise from a proposed amalgamation of a Polytechnic library with a public library. Mr. Andrew Fairbairn, Director of Education for Leicestershire, has advocated the advantages of establishing public library branches in those Colleges of Further Education which are suitably located. In the United States, papers on the topic have been delivered at recent Conferences of the American Library Association. At the 1981 Conference in San Francisco, one speaker went so far as to predict that "public, school and college libraries will merge into one library 10 to 20 years down the road."

While administrators have tended to emphasise the economic arguments for establishing joint-use library services, there are also, I believe, sound educational and social reasons for their development at the post-secondary level - not least the common constituency served by both the public library and the Community/TAFE College. Other factors are the central location of many colleges, the long hours of opening, and the substantial overlap in bookstock between college and public libraries. The Assistant Principal of the Open College in the Abraham Moss Centre was firmly convinced that the combined public/school/college library in the Centre had brought major benefits both to the educational institutions and to the community generally.

I RECOMMEND that the Department continue its policy of co-operation with local government in the provision of library services to the community, with particular reference to (i) co-ordinating the development of college library collections and services with local public libraries, and (ii) supporting the establishment of an integrated joint-use library where local conditions favour such a development.

C. Research and Evaluation; Staff Exchanges

An aspect of the tour which I found particularly valuable was the opportunity it gave me to visit a number of centres conducting research and evaluative studies in areas of particular relevance to the Department. These included, for example, the Council for Educational Technology in London, which is developing a range of survey instruments for the evaluation of library and media resources and services; the Centre for Library and Information Management at Loughborough, which is concerned with such aspects of library management as decision making and cost/benefit analysis; the Centre for Research in User Studies at Sheffield; the Open University and the methods developed for assessing the effectiveness of different media in its teaching programmes; the Ontario Educational Communications Authority, with its innovative approaches to media evaluation (such as the PEAC system); and the Far West Laboratory for Educational Research and Development in San Francisco.

The information gained in face-to-face discussions with senior staff in these and other centres, supplemented by numerous reports and other materials forwarded after my return, has broadened my personal horizons, and in many instances has had (or is likely to have) a direct applicability to the work of the Department. Thus colleagues in the Research Branch have found two of the research reports supplied by the Far West Laboratory to be highly relevant to their current investigations. The CET survey instruments and reports on the evaluation of learning resources have provided useful guidance to the Educational Resources Branch in our approach to this problem, while the investigative work of the two centres funded by the British Library (CLAIM and CRUS), may also be expected to have a continuing significance for our own responsibilities in this area. Consequently I have no doubt whatsoever that the Department, as well as the individual officer, stands to benefit substantially in both tangible and intangible ways from its support of study tours such as this.

Finally, in concluding this report, I feel special mention should be made of the very high level of interest I found in all three countries in the possibility of staff exchanges with corresponding Australian agencies and institutions. Support for the idea often came as strongly from senior administrators as from lecturers, researchers, media specialists and

librarians. In most cases the individuals concerned indicated they would be prepared to meet travel expenses themselves, and to arrange an exchange of accommodation with their Australian counterparts. I gained the impression that many of these individuals were highly qualified in their respective fields, and would be able to make a major contribution to departmental programmes, not least in areas such as computer-based learning and educational technology where we currently lack expertise. In return, our own staff would be able to gain invaluable experience in a fresh environment where innovative teaching methods and advanced technologies are already well established and have proved their effectiveness in practice.

I RECOMMEND:

(a) that the Department continue to support overseas study tours by Head Office and field staff to the extent that funds permit;

(b) that the concept of staff exchanges between DFE and educational agencies and institutions overseas be actively encouraged, particularly in areas of educational innovation where expertise within the Department is limited;

(c) that where staff exchanges are not feasible or appropriate, other alternatives be considered - for example, the granting of special leave to officers who may wish to apply for a short-term attachment or secondment to an overseas agency or institution in order to improve their expertise in relevant area(s) of responsibility.